THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 34 NOVEMBER, 1933 No. 2

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THE RUBBER AGE

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Vol. 34 NOVEMBER, 1933 No. 2

Developments in Use of RUBBER for Automobile Cushions

A Review of the Methods Gaining Favor in England for Automobiles and Buses

ENGLISH manufacturers of automobiles have, up to this time, made greater use of rubber in various forms for auto cushions than American producers. The reason for this is hard to determine for certainly rubber has been widely adopted for other purposes in American automobiles and there can be no prejudice against rubber as a material. Rubber has many advantages over the conventional form of spring padded cushions and it is to be hoped that American rubber manufacturers will help in convincing car makers of the desirability of adopting the more comfortable seat cushioning made possible by the latest improvements in rubber. The following review of English developments, as abstracted from an article in the British journal, "The Automobile Engineer", should therefore prove of interest to both rubber and automobile manufacturers of this country. (Editor.)

IN THE early days of body building, the degree of comfort imparted by an automobile seat was dependent upon two factors, namely, the body designer's ability to provide adequate dimensions, and the trimmer's skill. Present day methods of manufacture tend towards specialization and seat fillings, as also many other items of body equipment, are in many cases obtained from outside sources. Thus, while the designer is still to a large extent responsible for the degree of comfort imparted by the seats, the skill of the trimmer is only put to test in the final covering and padding, some forms of filling dispensing with the latter operation entirely.

The engineer has done much to minimize the transmission of road shocks, but it remains for the body builder to isolate the passenger from the body shell and to give additional resilience. The question of seating is, therefore, an important one, and in the attainment of comfortable accommodation the initial effort lies with the designer and is largely dependent upon the number of passengers to be carried in a body of given size.

It is in studying this aspect that certain forms of cushion filling would appear to offer greater advantages than others. For example, in the case of a low four-seater sports model in which the rear seats are placed above the rear axle, a deep spring cushion would be out of the question and recourse must be had to one of the various cellular rubber or pneumatic fillings with which a high degree of comfort is obtainable at minimum depth, thus preserving head room.

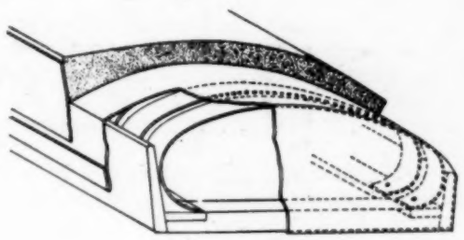


FIG. 1—Details of Lamplugh Seat

The conventional form of cushion consists of a spring case, canvas covered, padded with hair, and finally trimmed with cloth or leather over a lining of muslin. Spring cases are still in constant use, but now, particularly on smaller coachwork, are often replaced by pneumatic or cellular rubber fillings.

An interesting use of a rubber pad over the usual type of spring case is made in a seat produced by Lamplugh Spring Seats, Ltd., London. The spring assembly is covered with canvas which is tacked to the front and rear boards and over this is placed a pad of Dunlop cellular rubber, the pad being held in position by linen strips at-

tached along its four edges and tacked to the bottom frame as is shown in Fig. 1. Over this goes the final covering of leather cloth or moquette. The squab is constructed in the same fashion, except that there are no end boards to restrict the movement of the springs.

An alternative method of construction consists, in the

FIG. 2—Scaco pneumatic cushion with low pressure centers

case of a cushion, of Dunlop cellular rubber fitted direct to a flat or tapered seat board and shaped to the desired contour. The squab is constructed in a similar manner, but spring-steel slats are fitted at the ends and in the middle to provide a semi-bucket formation.

During the past ten years considerable use has been made of pneumatic upholstery and this form of filling is used as standard equipment on a number of popular cars. One of the best known forms of pneumatic upholstery is that bearing the name of Float-on-Air, produced by David Moseley & Sons, Ltd., Manchester. A feature of this up-

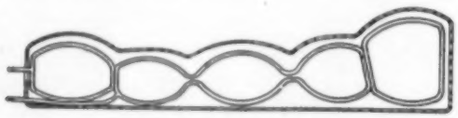


FIG. 3—Section through Scaco Cushion

holstery is the tubular method of manufacture which insures adequate support with very low air pressure. The method of manufacture is to select the appropriate size of tube and to fold the tube so that it fills the cushion to the required size, the folds being strapped together to prevent movement. In the case of a double cushion independent tubes are used for the centres, and the front and sides are supported by a separate tube. Each tube has its own valve but it is found that there is very little loss of air and a cushion may go for twelve months without need of inflation.

Another form of pneumatic upholstery is that bearing the name of Scaco, produced by the Self Controlled Air Cushion Co., Ltd., Manchester. This equipment has been used extensively in the past and a recent development is the use of a low-pressure centre portion surrounded by an

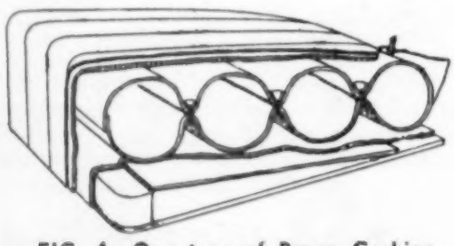


FIG. 4—One type of Paxon Cushion

outer bag that is inflated sufficiently to give solid support under the knees and to obviate side-roll.

A complete Scaco air bag of the type filled to a rear seat is shown in Fig. 2, from which can clearly be seen the disposition of the low-pressure centres that provide a soft resilient seat. Each bag has its own valve and thus a double-seat is provided with three valves while a single seat has two valves. It will be appreciated that the use of independent air bags in the case of a double seat does not cause a rush of air from the area of greatest load, while the use of a high-pressure surround, which as Fig. 3 shows, is of deeper section than the centre portion of the seat, insures the production of a well-shaped cushion.

A dual-pressure cushion has recently been added to the range of pneumatic equipment produced by Paxon, Ltd., London. The standard form of cushion consists, in the case of a bucket seat, of an air bag that by means of vertically disposed reeds is divided into three compartments. These compartments are not completely independent, for the reeds, which run across the cushion, do not extend to the full width.

It is commonly supposed that air bags of the type used for upholstery work are made throughout of extensible rubber but this is not so in the case of Paxon equipment. The underside of the cushion is composed of extensible rubber while the top surface and the reeds are of non-extensible rubber. Thus under load the underside of the cushion expands whereas the non-extensible top does not move, and to accommodate the expansion a special frame or grid, as it is termed, is supplied with each cushion.

The frame has no bottom and the air bag is mounted on rubber strips that pass from side to side of the frame. The position of the strips coincides with the position of the reeds and thus the fullness of each compartment is not directly supported and is quite free to expand under load.

Another type of Paxon cushion, illustrated in Fig. 4, makes use of stabilizing studs in place of reeds and a different form of supporting frame is used. This occupies less depth than that previously described and consists of a ⅜ in. baseboard, which at the front carries a 2½ in. deep

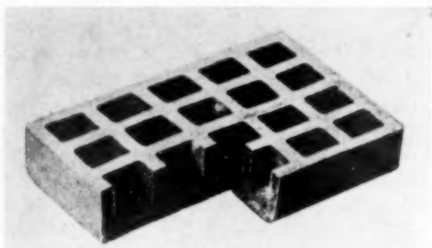


FIG. 5—Section of Dunlopillo Cushion

block running the full width. To the top of this block is attached a plywood panel which has its rear edge resting freely on the base board. Thus the foundation for the air bag has a certain amount of flexibility and friction between the rubber bag and the plywood panel is avoided by the interposition of felt.

In connection with seating, one of the most interesting developments of recent years was the introduction of molded cellular rubber upholstery by the Dunlop Rubber Co., Ltd. Briefly the process of manufacture is as follows: The purified latex is frothed or aerated by means of large whisks that produce countless air cells all interconnecting and having access to the outside atmosphere, thus insuring ventilation. By varying the degree of frothing the rubber can be graded in density and thus a cushion can be produced having a soft top and a hard base.

When aerated the substance is poured into suitable molds which impart a cavity formation to the cushion or squab as the case may be, after which the unit is vulcanized. The unit, which is shown in Fig. 5, leaves the mold with a porous skin and requires only its final covering, thereby effecting a considerable reduction in trimming costs. Dun

lopillo seating gives exceptional comfort, each air cell, of which there are millions, being a spring in itself. The material is light in weight, hygienic and vermin proof and is unaffected by change of temperature, damp, and continuous hard wear.

Sponge rubber seating composed of Sorbo material has been employed extensively in the past and is produced by Sorbo Rubber Sponge Products, Ltd., Surrey. The value of this material from an hygienic point of view can be judged from the fact that it is employed in a number of institutions in the form of mattresses, while it is also largely used for ambulances. In the case of seats the fillings are built up in the form of layers of sponge rubber as shown in Fig. 6, each layer being staggered so that suspension is obtained at every point of contact. A form of sponge-rubber spring used in one type of Sorbo seat, is also shown in the illustration.

A short time ago the Sorbo concern introduced a new seat for buses and coaches, the seat frame being made of drawn-steel tubing with cushion and squab built up on a plywood base. The cushion has a foundation of coil springs covered with a layer of hession over which is placed a

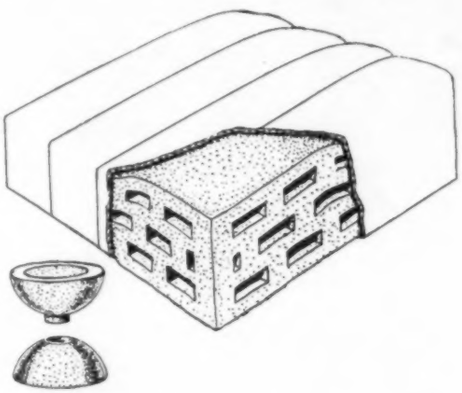


FIG. 6—Sorbo laminated cushion and cup type spring

1½ in. thick sponge rubber topping having a rounded edge to overlap the spring case. In the construction of the seat-back sponge rubber only is used, and a semi-bucket effect is produced by the inclusion of shaped ribs on the

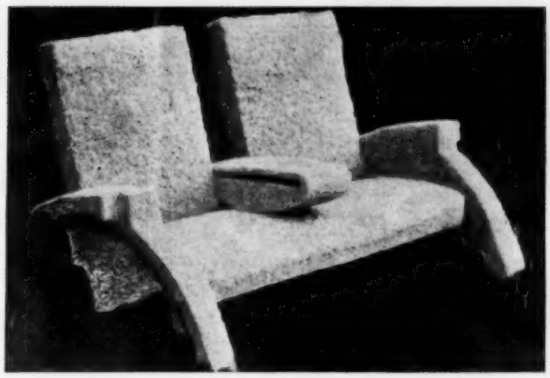


FIG. 7—A set of Hairlok molding for a rear seat

underside of the pad. The complete double seat, covered in leather or moquette, weighs about 36 lbs.

An interesting form of seat filling is that manufactured by the Hairlok Co., Ltd., London, their material bearing the name of Hairlok. It is composed of a special form of hair which is coated with rubber latex and, after being placed into special molds, is dried and vulcanized. It can thus be given any desired shape and it is of interest to note that the molds are of an inexpensive nature.

Figure 7 shows an example of Hairlok molded material. The seat is formed of a spring frame on top of which is placed the Hairlok pad, and a patented principle is employed whereby the edges of the spring frame are completely covered and the pad is located without the necessity of stitching. The rear squab is used without springs, the natural resilience of the material being quite sufficient for the purpose.

The side squabs are in one piece and fit over the wheel arches, incorporating the side arm rests. With this material the use of wood formers is avoided with a consequent saving in weight, and in this connection it is interesting to record that the use of this material on an Imperial Airways liner has effected a large saving in weight.

This material has been used with success by a number of body builders both on private and commercial coachwork, and an important point is that skilled labor is not necessary for its application. Hairlok can be placed over springs or air bags, and in the latter case a special mold is used to form a hollow on the underside of the pad.

"Stacol" Resin

STACOL is a new inorganic "resin" which is now being produced commercially for the first time. It is a clear glass-like material which is soluble in water and insoluble in organic solvents, oils, etc. It is neutral and twice as heavy as water. It melts to a clear viscous liquid. Its water solutions resemble sodium silicate solutions in giving dry, hard, glossy flexible films. They differ, however, in being neutral and unaffected chemically by acids or alkalies. Water solutions are considerably less viscous than the corresponding strength silicate solutions.

Stacol is finding application in coating and impregnating textile, paper, wood, linoleum, leather, rubber, etc., because it imparts fire resisting, weighting, stiffening and glazing effects at a reasonable cost. It may also be used in water colors and water inks. Stacol can be rendered acid or alkaline without affecting these properties. (Glyco Products Company, Inc., Brooklyn, N. Y.)

New Rubber Bonding Material

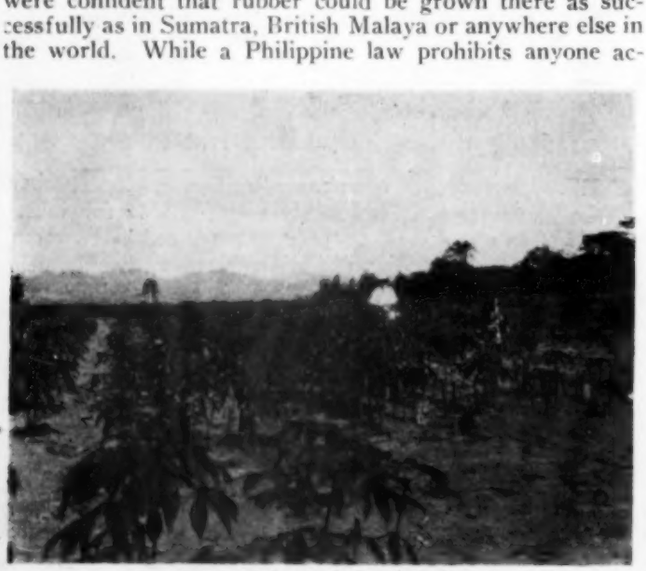
THE discovery has been made by the Dunlop Rubber Co. that materials which are very suitable for jointing rubber to metal surfaces may be produced by reaction of balata resins, gutta percha resins, etc., with sulphuric acid, sulphonic acids, stannic chloride, etc., provided that there is also present a polymerized or polymerizable unsaturated hydrocarbon such as, for example, rubber itself. The rubber is dissolved in the resin, the acid added, and the whole heated to 130 deg. C. for 30 minutes; the mass is cooled in cold water and crushed. In an example, crude balata is treated with a light petroleum solvent and 70 parts of the resulting resin are mixed with 30 parts of sheet rubber and heated to 100 deg. C., 10 to 20 per cent of phenol-sulphonic acid is added, and the temperature raised to 130 deg. C. Cooling and crushing follow, and the product is dissolved in toluene or carbon tetrachloride. It is then employed as a bonding substance.

Progress Reported on Goodyear Rubber Plantations

ACCORDING to J. J. Blandin, Goodyear crude rubber expert who recently returned from a six-months' trip to Sumatra, Java, Borneo, British Malaya and the Philippines, tapping on the Goodyear "Pathfinder" plantation on the island of Mindanao in the Philippines is expected to start early in 1935. The oldest Goodyear estate, "Dolok Merangir" in Sumatra has been in full production for some time while "Wingfoot" already has millions of trees planted and will start producing rubber in 1935. This plantation, the largest area of high yielding trees in the Far East, is conceded to be the finest rubber plantation in the world. Every one of its millions of trees is of high-yielding budded stock.

On Pathfinder Estate Before Planting

When Goodyear Tire & Rubber Company acquired 2500 acres in the Philippines in 1928, officials of the company were confident that rubber could be grown there as successfully as in Sumatra, British Malaya or anywhere else in the world. While a Philippine law prohibits anyone acquiring more than 2500 acres for agricultural purposes, Goodyear decided to open a rubber plantation there anyway, as it would give the company a nucleus from which expansion might be made in case the law were changed.



Budded Trees in Nursery—1930

1929 Planting with Puriana Cover Crop

Pathfinder Estate is on the Island of Mindanao. The estate lies along the Kabasalan River, five miles from Sibuguey Bay, on the east coast of the Zamboanga Peninsula and about 85 miles north of the town of Zamboanga. The Kabasalan River is navigable for only four miles; so it was necessary to build a light railroad a mile in length from the dock to the estate in order to bring in the materials necessary to clear the jungle and house and sustain the working force of 300 men employed there.

Alexander Muzzall, who was employed by Goodyear at Sumatra, was placed in charge. Under his supervision the work has progressed rapidly, and today nearly 2,000 acres have been planted with the best budded stock that could be obtained in Sumatra and British Malaya. Besides Mr. Muzzall, there is only one American at Pathfinder, Victor Hurley, assistant manager, in charge of the office force. A Filipino doctor is employed. In fact practically all of the office employees and laborers are Filipinos.

While there are a few scattered plantings of rubber trees here and there, Pathfinder is the only rubber plantation of any consequence on the huge Island of Mindanao. In all of the Philippines there are only two other plantations planted to rubber, and those are on a smaller scale and located on the Island of Basilan.

Goodyear is well pleased with this pioneering project in the Philippines. Every assistance in order to make Pathfinder a model estate has been given by all government officials from the governor-general down. Furthermore, Goodyear expects Pathfinder to be a profitable investment. Tapping will start late next year or early in 1935, and when the plantation is in full bearing an annual yield of 1000 pounds or better per acre is expected. At present the yield per acre of the majority of plantations is less than half that amount.

Paying Dividends on the Accident Prevention Dollar

By ERNEST W. BECK*
Supervisor of Safety, United States Rubber Company, New York City

DURING the last few years the work of every safety department has been required to justify itself on a business basis as well as on a humanitarian basis. Management is demanding that every dollar spent must return more than a dollar in tangible returns.

I think that one of the greatest satisfactions in safety work lies in the fact that well organized and efficient safety work pays big dividends—not only from a humanitarian point of view but also from a cold dollars and cents point of view.

In order to show that safety works pays it is the duty of every safety engineer to keep simple and accurate accident statistics and to use them. It is not sufficient only to keep such records, but in order to cash in on their values they should be properly used. The statistical work of a Safety Department is similar to the work of an Accounting Department in any well organized company. It is the Accounting Department that figures out the profit or loss—the same is true with the accident figures. They should also show the trend of your accident prevention work.

Records Should Be Compiled Monthly

Accident cost records should be compiled each month and cumulative figures distributed periodically. Accident cost figures should be studied not only by the Safety Engineer but by the plant management who should bring them to the attention of other members of the supervisory group including foremen. Even more emphasis should be placed on the poor accident experience, which shows high cost, than on the most excellent record.

It is extremely difficult for anyone to talk on this subject unless accident and cost figures are referred to. For the past twelve years I have always refrained from mentioning the accident and cost figures of the United States Rubber Company, but I have been asked this year to show you our figures and to use them as the basis of my discussion.

The company that I represent operates about 20 manufacturing units, employing approximately 30,000 employees manufacturing all lines of rubber products. We also operate 2 textile mills, a chemical plant, and a factory making shoe hardware including metal lasts.

The importance of safety is well recognized by the executive heads of the company and through their sponsorship accident prevention is made a definite part of our company policy.

In Table 1 you will note at the top a tabulation showing our accident experience during the last ten years. It is true that we have fewer factories and fewer employees than we had ten years ago. However, I want you to notice in particular the percentage of change during this period of time. You will note in 1923 we had over 1,100 lost-time accidents. This number has been reduced in ten years to 158. Our frequency rate has been reduced approximately 66⅔ per cent and our severity rate has been reduced approximately 50 per cent. You will be interested in knowing that the United States Rubber Company operated its factories for 34 consecutive months, covering the period from February 1, 1930, to December, 1932,

*Presented at the 22nd Annual Safety Congress of the National Safety Council, in Chicago, Ill., October 2-6, 1933.

TABLE 1

Accident Experience
All United States Rubber Company Plants

Years	*Deaths*	*Lost Time Accidents*	**Severity*	***Frequency*
1923	7	1,142	1,427	17.3
1924	3	916	1.05	16.7
1925	3	906	.96	16.0
1926	5	770	1.233	13.25
1927	2	541	.742	9.75
1928	1	686	.654	10.18
1929	5	757	1.172	13.04
1930	1	478	.644	9.64
1931	0	256	.559	6.77
1932	1	158	.723	5.49

*Severity—Number of days lost per 1000 hours worked.
**Frequency—Number of lost time accidents per 1,000,000 hours worked.

Compensation Cost
All United States Rubber Company Plants

Years	*Number of Compensable accidents*	*Cost per $100. of Payroll*
1923	558	.606
1924	475	.439
1925	506	.43
1926	459	.453
1927	347	.385
1928	371	.392
1929	462	.505
1930	300	.385
1931	163	.399
1932	119	.362

United States Rubber Company
Annual Safety Contest

Improvement for Co. as a whole—Year	1924	7.22%
"	1925	12.54%
"	1926	10.95%
"	1927	29.02%
"	1928	22.35%
"	1929*	28.68%
"	1930	17.63%
"	1931	27.72%
"	1932	53.47%

*Decrease.

without an industrial fatality—a total of 115,668,802 man hours without a loss of life. The tabulation, however, shows but one complete year without a fatality.

I think you will agree with me that when a company the size of ours, with its many factories scattered all over the country, can operate 34 consecutive months without a loss of life it is a record to be proud of. It was accomplished only by the united effort of our entire personnel.

While on this subject, I might also mention the Lycoming Rubber Company, one of our subsidiaries employing more than 2,000, which operated 15 consecutive months—a total of 3,512,990 man hours—without a *lost-time accident*. Our Shoe Hardware Company, employing approximately 250 people, which operates a foundry, completed 21 months or a total of 615,000 man hours without a lost-time accident.

The second group of figures in this table shows our compensation cost for all plants. The cost figures are not ex-medical but include 50 per cent. of all salaries paid to our plant doctors and nurses, and one-half the cost of all medical supplies. They include all money paid to outside doctors and hospitals and also legal expense. You will note that our cost has been reduced during the last ten years from approximately 60c per $100 of payroll to 36c per $100 of payroll. With an annual payroll of from 20 to 30 million dollars one can very easily figure the annual saving. A rate reduction of 25c per $100 of payroll on a 20 million dollar annual payroll amounts to a saving of $50,000 a year. This tabulation alone, I believe, proves conclusively that the accident prevention dollar, properly invested, pays big dividends.

You no doubt would be interested to hear how this reduction in cost is brought about. As you all know, safety is not a one man job. The success of safety can best be measured by the number of people in an organization who are actively interested in accident prevention work.

About ten years ago the executives in our company believed it would stimulate further interest in accident prevention to organize an annual safety contest. I will not burden you with the many details that have been carried on each year in conducting our annual contest. You will note from the third tabulation in this table that each year during the past 9 years, with the single exception of 1929, our company has shown an improvement in its accident prevention work. This tabulation is based on the percentage of improvement during any one year over the average of the previous three years. During 1929 there was a decrease caused by 5 deaths, 2 of which, however, were disputed claims and were settled on a percentage basis, but were considered as fatalities in our tabulation.

TABLE 3

Accident and Cost Experience
Mill No. 3—United States Rubber Co.

	1927	1928	1929	1930	1931	1932
Total Compensation Cost (Est. Expenditures)	$8,935	11,420	19,715	31,746	14,716	4,701
No. of Lost Time Accidents	38	34	43	52	58	23
No. of Compensable Accidents	36	15	25	48	29	15
Standing in our Annual Safety Contest	12th	14th	14th	9th	7th	2nd

I believe that every industry should know how its accident experience compares with other industries. Likewise, every factory should compare its accident experience with the experience of other factories in the same industry.

Years ago the rubber industry was considered as being a very hazardous business, and perhaps this was true because at that time the safety movement was young and many of our present safety devices were not in use. During the last few years, due to the splendid efforts on the part of the National Safety Council in accumulating industrial accident statistics, we are able to prove conclusively that the rubber industry is not now a hazardous industry.

In 1931 the rubber industry stood 10th best in frequency and 9th best in severity among 28 of the leading industries. The only industries having a better combined severity and frequency rate were the textile, printing and publishing, automotive, machinery, and glass industries.

In 1932 the rubber industry was 9th best in frequency and 6th best in severity among the 31 leading industries of the country. The only industries having a better combined severity and frequency rate than the rubber industry were the tobacco, laundry, printing and publishing, and textile industries.

This situation, I believe, is a big tribute to the accident prevention work that has been done in the rubber industry. It is a great satisfaction to have definitely overcome the hazards on machinery that is extremely dangerous, with its large inrunning rolls that are very difficult to guard at the point of operation. Our employees, by necessity, work very close to these heavy dangerous rolls for hours at a time. We have also had to overcome the hazards of our cement churn rooms, our equipment under pressure, the heavy conveyors, handling heavy molds, wind-ups, etc.

Table 2 shows the severity and frequency rates for the rubber industry as a whole, compared with the severity and frequency rates for our company during the last few years. We use these figures as a barometer to see how our company experience compares with the experience of the industry as a whole.

(Continued on Page 75)

TABLE 2

Comparative Accident Rates
Rubber Industry and United States Rubber Company

	Frequency	*Severity*	*Frequency* x Severity***
Groups: (year 1931)			
Tire	13.37	.79	10.6
Footwear	7.33	1.46	10.7
Mechanical	10.72	1.14	12.2
Reclaiming	18.31	3.52	64.5
All Groups in Rubber Industry including United States Rubber Company —year 1931	11.78	1.03	12.2
All Groups in Rubber Industry including United States Rubber Company —year 1932	9.86	.71	7.0
U. S. Rubber Co.—1932	5.49	.72	4.0
" 1931	6.77	.56	3.8
" 1930	9.64	.64	6.2

*Frequency—Number of Lost Time accidents per 1,000,000 man hours.
**Severity—Number of days lost per 1,000 man hours.

Many Uses of Rubber Made in Two New Railcars

RUBBER is continuing to take an increasingly important part in the development of modern railcars which are gradually supplanting the heavy conventional railroad passenger cars both in this country and abroad. Lighter weight of cars, greater speed and the necessity of better cushioning and shock insulation, all have tended to bring out the many desirable properties of rubber for attaining these ends.

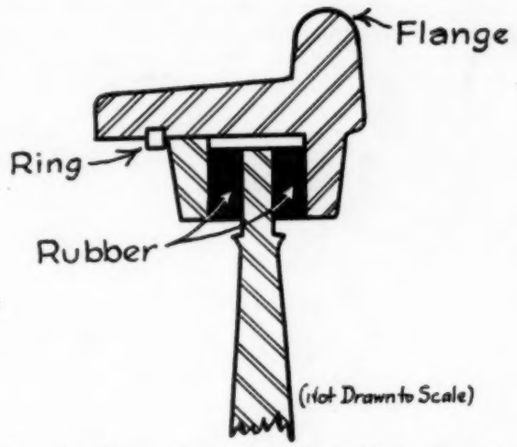
In a paper presented at an S.A.E. meeting in New York last month, Lowell H. Brown, president of the Belflex Corporation, reporting his observations of European railroad developments said:

"The principal items representing new developments and contributing to comfort of passengers in the cars inspected are concerned with deadening noise and reducing shocks and vibration. The motors are all mounted with some form of vibration absorbing device. Sound-proofing is used in one or two of the models between the frame work and outer covering of the body. Truck springs are equipped with shock absorbers. This new form of vehicle is still in an early stage of development and many improvements may be expected."

That rubber is the material in mind for deadening noise, reducing shocks and vibrations and possibly for the sound-proofing, goes without question. At the same meeting William B. Stout, of the Stout Engineering Laboratories, Inc., Dearborn, Mich., prophesied that in addition to stream-lining, lighter weight, and greater speed, trains of the future would have trucks and power plants mounted and insulated on rubber to insure noiseless railcar travel.

At the same time comes announcement of the new stream-lined, self propelled railway coach designed for high speed service, developed by the Stout Engineering Laboratories and the Pullman Company. This new coach, called the Railplane, makes rather extensive use of rubber as an insulation and as a shock and harmonics absorber.

The wheels of the car, made by the Timken Company, are rubberized under the steel rim so that the entire weight on the wheels is carried by rubber in sheer as shown in the accompanying sketch. The axles have their main bearings inside the wheels with cantilever springs on the four corners of the truck. Between the springs and the axle bearings, however, are compression rubber inserts to absorb all bearing noises which would otherwise go into the frame and to make a resilient fastening for the end of the spring. Thus, the entire truck is mounted with rubber insulation to prevent rail noises from going into the truck. Above the truck is a bolster running crosswise with a swing hanger at either end; this is also mounted on rubber, while the king pin at the center of the bolster again supports the entire weight of the car on rubber blocks. In this way there is no point on any part of the truck where an oil can can be used.



Showing Use of Rubber in Shear Under Steel Rim of Wheel in Railplane

The engines are mounted outside of the truck, also on rubber, so that none of the shocks and clicks of the engine vibration can be carried into the truck. The result of this rubber insulation with the motors on the truck and the trucks on the car is an exceedingly smooth operation; even with the engines turning over at full speed there is not the slightest tremor or feeling of the power plant in the main part of the body itself; whereas, because of the rubber the maintenance figure is very low.

The radius rods also have rubber ends, rather than oil bushings, and swing through their small angles without any friction other than in the shear of the rubber itself. The universal joint on the main drive shaft to the main gears is also of rubber type, as developed by the Timken Company, and is absolutely silent and carries no noise or shocks through to the final drive. Rubberized hair between the outer and inner skins of the shell acts as insulation against weather and noise.

With a frame of chrome-molybdenum steel tubing and a shell of duralumin, the car, sixty feet long and with a seating capacity of fifty persons, has a weight of but 25,000

Latest Budd 2-Car Stainless Steel Train

Stout-Pullman "Railplane"

pounds, as compared with the 160,000 pounds of a standard coach.

The Railplane's stream-lining, as established in the wind tunnels developed for aircraft designing, reduces wind resistance 50 per cent at ninety miles an hour. At this speed, according to engineers, the wind resistance on a conventional railroad coach consumes 90 per cent of the power necessary to propel the vehicle.

Power is furnished by two internal combustion engines of the automotive type. They are mounted on the front truck, with one driving the front axle and the other the rear of this truck.

The comfort of the passengers received attention as well as the efficiency and economy of operating the vehicle. The windows are sealed, set flush with the exterior of the body. The air is conditioned, heated or cooled to meet the conditions of the weather.

Another step in the development of railcars is seen in the new two-car train just completed by the Budd Manufacturing Co., Philadelphia, Pa., for the Texas & Pacific Railroad. This is a two-car stainless steel, "shotwelded," air-conditioned, rubber tired, gasoline driven train which can travel at 75 miles an hour.

New Budd Railcar

The new train is an outgrowth of the light-weight one and two car stainless steel trains recently built by Budd and now in successful use by the Reading Company and Pennsylvania Railroad. It contains many features which will appear in the 3-car streamlined train of stainless steel now being built in the Budd plant for the Chicago, Burlington and Quincy Railroad.

The complete train weighs only 100,000 pounds against a weight of approximately 600,000 pounds for a steam driven train and locomotive of similar capacity. Both cars combined weigh only a little more than one-half the 80 tons of a standard steel sleeping car.

The two cars are very different in construction and purpose. The forward or operating car, carrying no passengers, contains the two 240 h.p. American-La France gasoline engines and all propulsive machinery for the entire train in addition to the electrical apparatus, the air conditioning equipment, the 15-foot railway postal compartment and a large baggage room. The only wood used in the train is in the replaceable maple floor boards and some of the postal equipment in this car which rides on two 4-wheeled steel tired trucks each carrying two 300-volt Westinghouse motors.

Windows Are Sealed

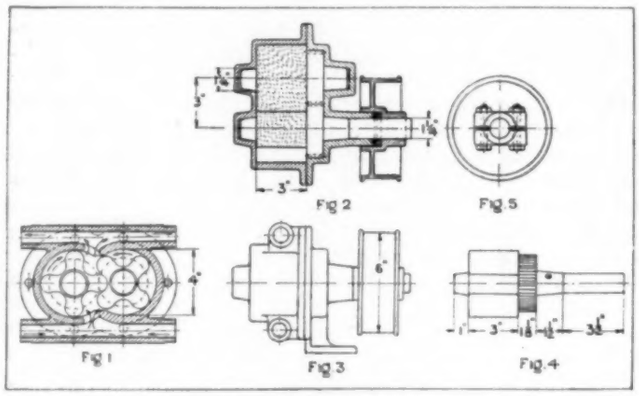
There will be no battles with sticking windows and no flying cinders in the second car. The windows are sealed shut and clean air, constantly circulated from ceiling ducts is refrigerated in summer and heated in winter. Indirect lighting, from the same ducts, is brilliant but with total absence of glare. The seats in both compartments are 38 inches wide, deeply upholstered and covered with blue leather.

This car rides on sixteen pneumatic tires divided between two 8-wheeled trucks equipped with Timken roller bearings and is completely silent, there being no moving apparatus of any kind. It is further insulated from vibration by a flexible Coupler of Budd design, between the cars. Safety features of the train comprise a quick acting double braking system, complete automatic lighting and signal equipment, non-shatterable glass, automatic power and electrical shut-off to avoid fire hazard and automatic engine stops when oil pressure fails.

Each car is 68 feet long outside. The headroom in the passenger car under the lighting and air-conditioning ducts is 6 feet, 8 inches. This car is 8 feet, 10 inches wide inside and 9 feet, 4 inches wide outside.

All-Rubber Geared Suds Pumps

A WRITER (J. T. Towlson) in a recent issue of *American Machinist* suggests the production of rotors of rotary pumps for suds fully in rubber, such rotors comprising the impellers (proper) and the spur gears, as well as the shafts. Experiments seem to show that the all-rubber rotor is an altogether practical proposition. As regards cost, rubber is inexpensive. The molds are admittedly expensive, although in the hands of experts not so costly as persons unfamiliar with the resources of mold design-



All-Rubber Geared Suds Pumps

ers might imagine; and the molds being made, the articles may be produced at little cost and in a finished condition, quite suitable for assembly with slight buffing of "spews." Further, rubber when composed of the correct composition is competent to distribute the regular classes of suds without the least injury. Again, with rubber more close fits may be made, as well as maintained, for pumping purposes than is even possible with metal-to-metal contacts.

The experiments referred to were in respect of rotors (or impellers) of the form shown in Fig. 1, while to augment the usefulness of the pump suction as well as delivery was taken to and from each side, as shown.

Fig. 2 gives a plan of the pump, but with the casing, the impellers, and the driving pulley in section, Fig. 3 is an end elevation and Fig. 4 a detail of the driving shaft and impeller.

In dealing with rubber the diameters of shafts and bearings are made greater than the diameters consistent with metal shafts. Moreover, as all such things as keys and screws are barred, the pulley (Fig. 5) is made to give a dependable grip by means of a bolted split boss; and to take the pull of the belt off the shaft, as well as to relieve the main bearing of undue stress, the bore of the pulley boss is made to run on the boss of the cover. Although with a pump constructed as shown there is small tendency to leak along the shaft, all drip is prevented by a rubber ring kept tight in a taper groove by a loose gunmetal washer forced lightly against it, by means of the pulley. The bearings have all been given considerable taper, this being fully justified by the fact that such provision made assembly quite easy.

Preparation of Tensile Test Strips

IT IS very difficult to obtain accurate tensile tests on pure gum compounds, especially if the samples to be tested are slightly undercured. Such samples are liable to cut off in the testing machine jaws, rather than to break in the narrow part of the "dumb-bell.." This condition may be almost completely eliminated if the enlarged ends of such samples are thoroughly dusted with mica or talc. (R. R. Olin Laboratories, Akron, Ohio.)

Recent RUBBER LATEX Patents

Abstracts of U. S. Patents on Latex and Its Uses in Manufactured Products from July 1932 to Date

By FREDERICK MARCHIONNA*

(Continued from October Issue)

IN answer to many requests for later information on latex patents than that contained in his book, "Latex & Its Industrial Applications", Mr. Marchionna has prepared brief abstracts of all of the more important U. S. patents on latex from July, 1932, to date and these abstracts will be published in this journal from time to time. The second installment appears below and additional installments will be published as soon as they are made available. Anyone desiring further particulars about any patent or patents may obtain them by sending ten cents for each patent, giving the number only, to the Commissioner of Patents, Washington, D. C. For those desiring to insert abstracts of the latest latex patents in their copies of "Latex & Its Industrial Applications", reprints of this series of articles may be obtained without cost by applying to the publishers for each article as published.

73—CREMER—U. S. 1,893,465—Jan. 3, 1933—*Rubber Strips and Threads.*
A special drawing inking pen is used to form threads and strips from latex fed into the pen.

74—VAN HEURN—U. S. 1,893,477—Jan. 3, 1933—*Vulcanized Acid Latex.*
Latex is vulcanized with nascent sulphur from alkali thiosulphates in an acid medium, so as to obtain a vulcanized acid latex.

75—SAEGER—U. S. 1,893,683—Jan. 10, 1933—*Core and Mold Binder.*
Crude rubber or latex containing a small quantity of toluylene diamine is used as binder for moulding sands.

76—SAEGER—U. S. 1,893,684—Jan. 10, 1933—*Core and Mold Binder.*
Toluylene diamine above is substituted with benzidine.

77—GARDNER—U. S. 1,894,168—Jan. 10, 1933—*Treating Pigments.*
Titanium oxides or similar pigments are treated with substances forming an insoluble compound therewith, or with latex, casein, etc.

78—TWISS et al—U. S. 1,894,629—Jan. 17, 1933—*Molded Dipped Articles.*
Molded dipped articles are made by dipping the former first in an acid latex and then an alkaline latex to prevent draining away of the latex.

79—CHISHOLM—U. S. 1,894,461—Jan. 17, 1933—*Rubber Threads.*
A core of textile thread is covered with a helical winding of other fibrous thread, and while under tension immersed in a latex bath.

80—JOY—U. S. 1,894,610—Jan. 17, 1933—*Rubber Shoes.*
The wings of the upper of an over shoe are adhesively secured at their lower ends by means of a latex-impregnated cord.

81—TAYLOR—U. S. 1,895,088—Jan. 24, 1933—*Coloring Rubber.*
Rubber is colored by combining relatively large quantities of inert pigments with latex; applying the mixture to a base, and coloring with an oil-soluble dye in a solvent.

82—SHUGG et al—U. S. 1,895,738—Jan. 31, 1933—*Electrolytic Condenser.*
A hard rubber cover is made from a latex mixing, and a soft rubber nipple from a latex mix, is applied thereon.

83—NEILEY—U. S. 1,896,054—Jan. 31, 1933—*Heat Sensitive Latex.*
Complex metallic-ammonium salts, such as the NH_4-Zn-SO_4 or similar salts are added to latex, which on heating will release coagulable anions.

84—WATKINS—U. S. 1,896,263—Feb. 7, 1933—*Coating Metal Surfaces.*
Metal surfaces are given strongly adherent rubber coating by applying successively a hard rubber cement, a softer rubber coating, and a latex layer.

85—COVEY—U. S. 1,896,574—Feb. 7, 1933—*Non-Skid Rubber Tires.*
The carcass of a rubber tire is given a substantial thick coating layer of latex so as to leave a roughened surface.

86—MOORE—U. S. 1,896,783—Feb. 7, 1933—*Elastic Fabric.*
Elastic yarns containing rubber threads made from latex are used for making into woven fabric.

87—HARRISON et al—U. S. 1,897,034—Feb. 14, 1933—*Dental Impression Material.*
Mineral oil, vegetable drying oil, waxes, a water insoluble soap, and small quantity of latex are mixed and used as dental impression material.

88—SAEGER—U. S. 1,897,149—Feb. 14, 1933—*Joining Parts of Molds.*
The various parts of a mold for casting metals are joined by means of a rubber or a latex cement.

89—CROCKETT—U. S. 1,897,189—Feb. 14, 1933—*Vulcanizing Latex.*
Sulfur in excess of that required for vulcanizing rubber is added to latex, heated to vulcanize and free sulfur allowed to settle out and removed.

90—HOPKINSON—U. S. 1,897,479—Feb. 14, 1933—*Fibrous Products.*
Paper pulp containing latex is projected under high pressure between two conveyor belts to form a paper of the required thickness.

91—FOSTER—U. S. 1,898,043—Feb. 21, 1933—*Rubber Mold.*
A pre-shrunk fabric is fit over a mold, and a filtering layer applied thereover—articles made by dipping the above mold in latex.

92—TWISS et al—U. S. 1,898,604—Feb. 21, 1933—*Concentrating Latex.*
An oscillating or rocking centrifuge is used for concentrating latex.

93—DAY—U. S. 1,898,985—Feb. 21, 1933—*Fibrous Products.*
A diluted asbestos slurry is combined with a suitable quantity of fillers; mixture is dehydrated partially, haemoglobin-preserved latex added, and mixture poured in a vessel and coagulated by heating.

94—DARKY—U. S. 1,899,016—Feb. 28, 1933—*Dehydrating Rubber Deposits.*
Latex deposits are surrounded with Hg or other conducting fluids, the latex deposits and conducting fluid are connected to a source of current to hasten the dehydration of the deposit.

95—NEWTON—U. S. 1,899,243—Feb. 28, 1933—*Aqueous Dispersions.*
An insoluble metal soap is worked into solid rubber, and water with a water soluble soap gradually worked therewith to produce an artificial latex.

96—TEAGUE—U. S. 1,899,535—Feb. 28, 1933—*Rubberizing Water Repellant Materials.*
Stone, concrete, cork, fibrous base, etc., are first treated with a polar compound, and then impregnated with latex which will penetrate throughout the base.

97—MITCHELL—U. S. 1,900,944—Mar. 14, 1933—*Reclaiming Process.*
Fibrous rubber wastes are worked with a hydrophilic colloid and/or a stripping agent, such as glycerol, dispersed in water, and the fibres removed.

(*) Author "Latex & Its Industrial Applications," published Feb. 1933 by THE RUBBER AGE, N. Y.

98—HILL et al—U. S. 1,900,951—Mar. 14, 1933—*Fibrous Products.*
A latex impregnated fibrous web is treated with an alkali hydroxide and worked mechanically to remove the stiffness of the product.

99—WARTH—U. S. 1,900,963—Mar. 14, 1933—*Bottle Closure.*
A latex mixing containing large quantity of bentonite and less than 1% S is worked into the channel of the shell of the crown type closure.

100—SAEGER—U. S. 1,901,124—Mar. 14, 1933—*Mold and Core Binder.*
Latex is applied on the surfaces of the sand mold to better bind the sand.

101—WARTH—U. S. 1,901,682—Mar. 14, 1933—*Bottle Closure.*
A cork disk is inserted in the cavity of the closure shell, and the entire exposed surface of the shell is coated with latex.

102—ELBOGEN—U. S. 1,902,627—Mar. 21, 1933—*Matrix Molds.*
The matrix of a mold is made by applying a layer of latex rubber over the clay model, with or without layers of plaster of Paris.

103—HAZELL—U. S. 1,903,106—Mar. 28, 1933—*Extruding Nozzle.*
A nozzle for extruding latex threads is made with a spinneret of a non-circular shape.

104—GILLIES—U. S. 1,903,106—Mar. 28, 1933—*Heat Insulating Tape.*
A woven asbestos fabric of tubular form is filled with loose fibres and coated with latex all around—resulting tape placed around pipes.

105—CALCOTT et al—U. S. 1,903,500—Apr. 11, 1933—*Synthetic Rubber Products.*
Vinyl acetylene is emulsified, combined with guayule resin and polymerized in the presence of rubber latex.

106—TWISS et al—U. S. 1,904,576—Apr. 18, 1933—*Waterproofing Paper Container.*
A mixture of 50% each of rubber in form of latex, and a wax is used for proofing paper and other fibrous containers.

107—SULLIVAN—U. S. 1,903,578—Apr. 11, 1933—*Coloring Rubber.*
Latex is mixed with Victoria blue and then with a color intermediate to the blue, such as phospho-tungstic acid to precipitate a colored compound coated with rubber. Batch used for mixing with rubber to color it.

108—SCHACHT—U. S. 1,904,087—Apr. 18, 1933—*Paper Products.*
A cork-fibre pulped web is covered with a fibrous web and the structure impregnated with latex.

109—SLAGLE—U. S. 1,905,008—Apr. 25, 1933—*Rug and Carpet Underlay.*
A creped paper is coated on both sides with latex and used between the floor and a rug to prevent slipping of the latter.

110—ALMY—U. S. 1,905,026—Apr. 25, 1933—*Waxy Products.*
Thermoplastic Products are made by adding large quantity of a melted wax into a heated concentrated latex with agitation.

111—VAN HEURN—U. S. 1,905,404—Apr. 25, 1933—*Paving Blocks.*
Hard rubber is made from a latex mixing, crumbled, mixed with gravel, basalt slags, etc., and pressed into blocks for paving.

112—RICHTER et al—U. S. 1,905,749—Apr. 25, 1933—*Leather Substitute.*
A highly porous web of alpha cellulose is impregnated with latex and thereafter impregnated with a solution of a phenol-aldehyde resin.

113—WEBER et al—U. S. 1,906,028—Apr. 25, 1933—*Upholstery Pads.*
Stuffing for pads, mattresses, etc., are treated with latex to coat the individual fibres with rubber and molded without any compression.

114—HOWARD—U. S. 1,906,378—May 2, 1933—*Anode Support.*
Rubber articles to be made by anodic deposition are suspended and supported from tantalum or columbium metal.

115—SEMON—U. S. 1,906,426—May 2, 1933—*Brush Manufacture.*
The bristles of a brush are secured to the backing by means of natural latex or preferably an artificial aqueous dispersion of rubber.

116—GIBBONS—U. S. 1,906,569—May 2, 1933—*Rubber Molds.*
A mold for making molded dipped articles comprises a knurled metal support, a filtering layer, and a facing of powdered clay.

117—KLEIN et al—U. S. 1,906,618—May 2, 1933—*Electrophoretic Process.*
Salts of Ca, Mg, Ba, Qn, Fe, Al, or esters the urethans yielding H-ions are added to the latex in the electrolytic cell to produce coherent rubber deposits.

118—ORTHNER et al—U. S. 1,907,156—May 2, 1933—*Coloring Rubber.*
Al-lakes of hydroxy or hydroxy-amino anthroquinone sulfonic acids are employed for coloring crude rubber or latex.

119—BREWSTER—U. S. 1,907,492—May 9, 1933—*Floor Covering.*
Loose fibres arranged in substantial parallel relation are embedded in rubber latex, and the product used as rugs, carpets, mats, etc.

120—BYAM et al—U. S. 1,907,496—May 9, 1933—*Gas Cell Material.*
A balloon fabric is coated successively with rubber, and several layers of latex-glycerine-viscose coatings which are coagulated by gaseous SO_2.

121—HOWLAND—U. S. 1,907,545—May 9, 1933—*Preserving Rubber.*
Compounds of the general formula (R_1-NH-R_2-NH) n-Y in which R and R_1 may be aryl and arylene group, and Y an acidyl group are used for preserving latex or rubber from oxidation.

122—TUCKER—U. S. 1,907,616—May 9, 1933—*Asbestos Products.*
Asbestos fibres are dispersed in a Jordan engine in the presence of adsorbable cathions like $AlCl_3$, $ThNO_3$. Dispersion combined with latex.

123—TUCKER—U. S. 1,907,617—May 9, 1933—*Asbestos Products.*
The asbestos dispersion above is combined pre-aggregated latex whose rubber particles vary in size from 50 to 200 mu.

124—WESCOTT—U. S. 1,907,634—May 9, 1933—*Asbestos Products.*
Asbestos is dispersed in latex stabilized with haemoglobin or similar heat coagulable proteins, and mixture heated to coagulate the mass.

125—MURPHY et al—U. S. 1,907,856—May 9, 1933—*Rubber Shoes.*
Bathing shoes made by laying first the insole and sole on the last, and then the upper part with rubber latex of different color and density.

126—McMANUS—U. S. 1,907,994—May 9, 1933—*Bottle Closure.*
The ring groove of the bottle cap is sealed with a rubber ring containing latex, asbestos and talcum powders.

127—RICE—U. S. 1,908,643—May 9, 1933—*Window Channel Guide.*
A felt pad is impregnated with latex and combined with rubber to make a shaped composite article used as channel guide.

128—BEAL—U. S. 1,908,654—May 9, 1933—*Treatment of Rubber Deposits.*
Rubber deposits from latex, while still fresh and uncoagulated, are washed with an alkaline solution containing a peptizing agent.

129—WILSON—U. S. 1,908,719—May 16, 1933—*Coating Processes.*
Solid smooth surfaces are coated with a coagulant solution which is partly dried, and then with rubber latex coatings.

130—BECKUITH—U. S. 1,909,089—May 16, 1933—*Shoe Filler.*
Latex is combined with filler and blowing agents applied to the shoe bottom, and the blowing agent decomposed to produce a sponge rubber filler.

131—STRANCH—U. S. 1,909,080—May 16, 1933—*Lubricating Materials.*
An emulsion of the water-in-oil type is promoted by means of latex and used as lubricating material for combustion engines, etc.

132—KLEIN et al—U. S. 1,909,364—May 16, 1933—*Impregnation of Porous Articles.*
A mold is saturated with a coagulant, coated with rubber, covered with a fabric, and then whole coated with latex.

133—BURSE—U. S. 1,909,455—May 16, 1933—*Fibrated Rubber.*
Latex is deposited into a sheet, stretched, and while under tension vulcanized—the sheet so produced is easily split into strips and filaments.

134—ABBOTT—U. S. 1,909,512—May 16, 1933—*Rubber Bands and Threads.*
A special apparatus for making rubber filaments from latex continuously.

135—BECKMAM—U. S. 1,909,746—May 16, 1933—*Substitute Veneer Material.*
Two or more layers of micro-porous rubber obtained from latex are joined securely by means of an adhesive latex and used as facings for bricks, walls, etc.

136—POPE—U. S. 1,909,892—May 16, 1933—*Reinforced Fabric Articles.*
A fabric base is coated with latex, wrapped over a former and dipped in latex—stripped and applied over springs of motor vehicles, etc.

137—HANTHAWAY—U. S. 1,910,244—May 23, 1933—*Aqueous Dispersions.*
Rosin is combined with rubber to reduce the fluidity of the latter, and mixture dispersed in water in presence of colloids.

138—JAMES—U. S. 1,910,547—May 23, 1933—*Acid Latex.*
NHs—preserved latex is treated with HCHO to obtain a pH = 6 + or —, and a large quantity of 40% acetic acid stirred in to produce a stable acid latex.

139—TWISS—U. S. 1,910,579—May 23, 1933—*Cathodic Electrodeposition.*
Acid latex is compounded with fillers, etc., having positive charges, and introduced in a cell whereby rubber is deposited at the cathode.

140—TWISS et al—U. S. 1,910,580—May 23, 1933—*Electrophoretic Process.*
A cell separated with permeable diaphragms is filled on one side with acid latex, the other side with alkaline latex—the diaphragm is impregnated with latex by mutual discharge of the rubber in the latices.

141—ASHCROFT et al—U. S. 1,911,343—May 30, 1933—*Chenille Carpet.*
A chenille web is cut into strips which are formed into V-shape and coated on the undersurface with latex; applied to bottom of loops of a back.

142—LEVIN—U. S. 1,911,631—May 30, 1933—*Floor Covering.*
A mastic floor covering is made by combining sand, cork, etc., an aqueous dispersion of rubber, and reinforcing fibres, such as asbestos, wool, etc.

143—MILLER—U. S. 1,911,841—May 30, 1933—*Shoe Stiffeners.*
A shoe stiffener is made by impregnating a web with a latex containing starch, dried, and cut into blanks for box toes.

144—OLIN—U. S. 1,912,591—June 6, 1933—*Porous Rubber Articles.*
Rubber or latex is combined with petrolatum, triethanolamine, and a blowing agent in powder form, and an oily paste—Blown into sponge.

145—JAMES et al—U. S. 1,912,641—June 6, 1933—*Coloring Rubber.*
Acid latex is colored by means of basic organic dyes, the colored ions of which are cathions. Examples: malachite green, etc.

146—HAUSER—U. S. 1,912,939—June 6, 1933—*Coloring Rubber.*
Dyes are combined with solid rubber; mixture is dissolved in a rubber solvent and mixed with latex—colored latex applied as coating.

147—VAN HEURN—U. S. 1,913,014—June 6, 1933—*Coloring Rubber.*
Suitable fibres, such as kapok, admixed with latex; mixture is coagulated, sheeted and colored by dipping in an alcohol solution of a dye.

148—ARPIN—U. S. 1,913,017—June 6, 1933—*Creped Paper Products.*
Paper is creped, impregnated with a latex-glue-glycerine sizing mixture, and dried while maintaining the wrinkles in the web.

149—McCORMICK et al—U. S. 1,913,283—June 6, 1933—*Paper Products.*
A continuation of patent 1,857,000. The paper product of this patent is impregnated with latex, cellulose esters, synthetic resins, waxes, bitumen, etc.

150—MEAGHER—U. S. 1,914,148—June 13, 1933—*Elastic Fabrics.*
The edges of an elastic fabric are impregnated with latex, and these edges are attached to a woven inelastic fabric and stitched.

151—CHARBONNEU—U. S. 1,914,402—June 20, 1933—*Anti-Slip Article.*
A burlap base is impregnated with diluted latex and coated on one or both faces wtih a more concentrated latex to produce a tacky article suitable for preventing slipping of floor coverings, table tops, etc.

152—RAFTON et al—U. S. 1,914,527—June 20, 1933—*Paper Products.*
A latex paper of improved quality is made by mixing an alkaline earth filler in a paper pulp and incorporating latex in mixture.

153—SEWALL—U. S. 1,915,339—June 27, 1933—*Leather Substitute.*
A large number of thin tissue-like creped paper are superposed and impregnated with latex containing casein as stiffening agents.

154—LANE—U. S. 1,915,828—June 27, 1933—*Ornamented Rubber Articles.*
Articles having a mottled appearance are made by dipping a suitable former in differently colored coarse dispersions of rubber.

Paying Dividends on the Accident Prevention Dollar

(Continued from page 70)

You might be interested to see how we use the figures at a particular factory. (Table 3) This tabulation shows the accident and cost experience of a factory employing from 1500 to 2000 employees manufacturing mechanical rubber goods including fire hose, packing, belting, rubber tiling, etc. You will note that during the four years, 1927 through 1930, the accident experience at this plant did not improve. In October, 1930, a decided change was made in the entire safety program at the plant. An experienced full time safety man was engaged, safety committees were organized, safety foremen meetings were held and the safety advisory committee, composed of executives, met monthly to discuss safety policies and pending safety matters. You will note the result. Within one year the cost was reduced $17,000 and within two years the cost was further reduced $27,000. This is another splendid illustration which shows that well organized safety effort pays big dividends. This particular factory had trailed along for several years well down in the list of factories in our annual safety contest. However, last year they had the honor of receiving a cash prize for winning second place in our annual safety contest.

I cannot help but mention the excellent work at one of our textile mills. During 1928 they had 77 lost-time accidents; 1929—50; 1930—13; 1931—2; 1932—2; and during the first 7 months of 1933 they have had but one lost-time accident. This wonderful improvement did not just happen but is the result of united effort on the part of the manager and his associates.

Don't think that it is necessary to spend large sums of money in order to get dividends. I know of small factories where there is no safety organization but the management is constantly taking the time (and I believe time is worth more than money) to impress all of his associates with the importance of accident prevention work. As an illustration—I know of a large plant where an employee coming down stairs one night slipped on an apple core, falling in such a manner that he broke his back. The poor man has not worked a day since. In the small factory that I have just referred to no one in the plant could imagine anyone throwing or leaving an apple core on the stairs.

In conclusion, I wish to say that you have a job that will never be finished. You are fortunate in having a supervisory position where your efforts, to a certain extent, can be measured in dollars and cents but in the final analysis the dollar and cents saving is infinitesimal compared with the saving of lives, limbs and suffering that always accompanies a well done job on accident prevention work.

Cord Tire Fabric Loom

A RECENT improvement in Cord Tire Fabric Looms has been announced by Hacking & Co., Ltd., Bury, England, according to a descriptive article in the *Textile Mercury*, Manchester, England. An outstanding feature of the new loom, illustrated herewith, is the means of adequately controlling the let-off of the warp in syncronization with the take-up motion, and further in so arranging the take-up motion as to secure the minimum of contraction in the cloth on the cloth roller.

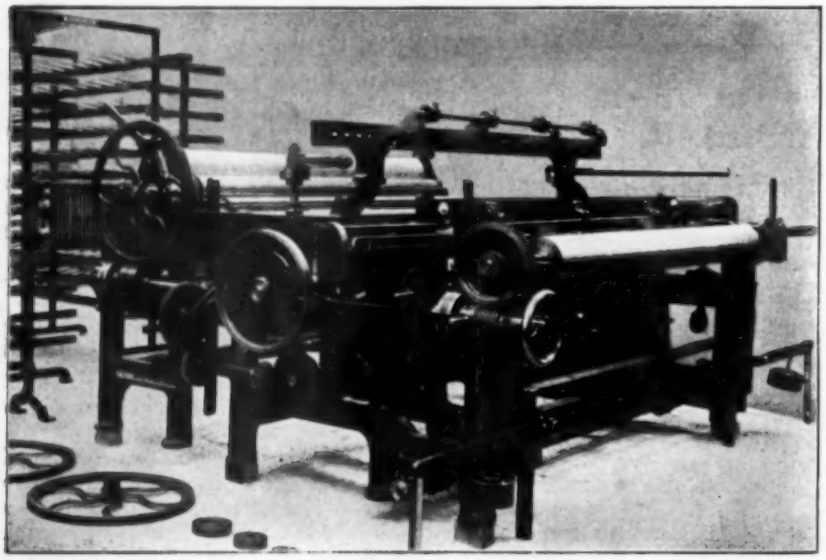
The loom is designed to take a roll of cloth 30 inches in diameter. The cloth is placed on a wood roller made to fit on a square bar, and is held in continual contact with the take-up roller, the latter taking the place of the breast beam. The method of keeping the cloth in contact with the take-up roller is by means of racks, rack boxes, levers, and weights.

The patented let-off and take-up motion is of the worm and wheel type. The let-off or draw rollers are controlled in the following manner. A bevel wheel on the bottom shaft of the loom gears with a bevel pinion on the counter sideshaft, on the other end of which shaft is the main change wheel. The changing of this wheel affects both the let-off motion and the take-up motion.

Through an intermediate wheel the change-wheel is geared with a pinion on the sideshaft of the loom, and from this sideshaft both the motions referred to are driven. From a worm on the rear end of the sideshaft is driven a large worm wheel, this also being a change-wheel and used to counteract the contraction of the warp ends due to weft intersections, i.e., when more picks per inch are inserted, resulting in greater contraction of the warp, a wheel with a smaller number of teeth will be used, but the changing of this wheel is not necessitated unless the increase or decrease in the number of picks per inch is considerable.

As already mentioned, the sideshaft, in addition to driving the let-off motion, also controls the take-up motion, this by means of a worm and wheel placed at the front end of the sideshaft and positively driving the take-up roller. Both worms are connected to the sideshaft by friction clutches, capable of control from the front of the loom. By releasing the clutch controlling the take-up motion worm, the weaver, by operating a hand-wheel, may let slack, or strain up, as desired, and when the desired tension has been obtained the clutch is re-engaged.

As usual in the weaving of cord tire fabrics the warp ends are taken from a large creel, the one illustrated being suitable for 1,728 ends. The ends are passed through eyelets and also a back reed, to the draw rollers. Between the let-off or draw rollers and the front reed is a faller roller, this retaining the tension on the warp when the weaver has occasion to let slack.



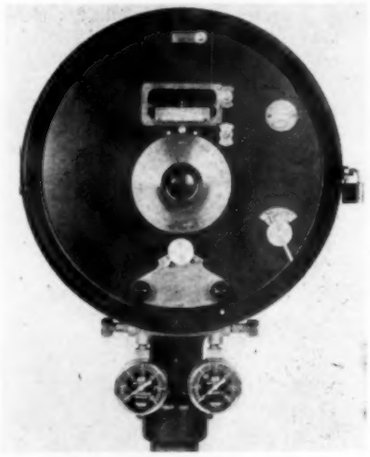
Hacking's New Cord Tire Fabric Loom with Patented Let-off and Take-up Motion.

Potentiometer Stabilog

The Potentiometer Stabilog—an instrument combining the many features and advantages of Stabilog control and potentiometer temperature measurement—is the latest control equipment manufactured by the Foxboro Company, Foxboro, Mass.

Through the development of this instrument, the 100% automatic control provided by the Stabilog system is made available for temperatures up to 2800° F., (1500° C.). In addition, the long-distance feature of the potentiometer measuring system makes the instrument particularly valuable where there is a great distance or height between the point of measurement and the controller. Where it is desirable to use this instrument on the lower temperature ranges, the Wheatstone Bridge and resistance bulb measuring system is used.

The Potentiometer Stabilog is a non-recording instrument but it is so constructed that a record of its operation may be made on a Foxboro recording potentiometer pyrometer using the same thermo-couple. One multiple-point recorder may be hooked up with as many as six Potentiometer Stabilogs thus recording and controlling from the same thermo-couples.



Potentiometer Stabilog

Equipment Makers–

If you have recently introduced any new machines or other equipment used in rubber factories, send us details and they will be described in these pages. [Editor]

Editorial Comment

Price Increases

"THE most severe indictment that could occur against industry would be a conviction of foolhardy price increases," declares Henry H. Heimann, Executive Manager of the National Association of Credit Men, in his latest review of business. He states in part:

"Industry must not overlook the fact that for over a decade it has asked for an opportunity to regulate itself. It now has the authority to regulate itself and if it is unsuccessful in its effort the only conclusion that could be reached is that the opportunity was given to industry prematurely and that it was not sufficiently cooperative or broad visioned to deserve it. The Industrial Recovery Act is not governmental regulation. It is legislation permitting industrial self-discipline under governmental authority. If this fact is constantly kept in mind, industry may interpret the Act in better fashion.

"The President's Re-employment Agreement was intended to meet an emergency situation. At no time was it felt that long term benefits would flow from these moves. The real benefits of the Industrial Recovery legislation were expected from the permanent codes wherein the many unfair trade practices and trade abuses about which industry has for years been complaining, could be corrected with legal authority if industry demonstrated its ability to work together.

"It has been distinctly harmful to the program to have people look upon it as a great experiment, without giving consideration to the fact that it is an evolutionary program. The Federal Trade Commission, had it been provided power to enforce its fair trade practices, would to all intents and purposes been a parallel to our present industrial recovery legislation. Out of the experience of the Federal Trade Commission and through a recognition of its shortcomings, subconsciously in the minds of industrial and administration leaders there evolved the present industrial recovery program.

"Amendments to the industrial recovery legislation will be necessary; administration of the Act will need new viewpoints and more positive clarifying action. Perhaps the present status will insure the expedition of these changes. The need of re-appraisal has been evident for a number of weeks. Tolerance and patience are constructive factors in fashioning a program that only years will evolve in its truly acceptible economic form."

Advertising Under NRA

THE question has come up frequently, in the rubber industry as well as in other fields, what advantage there will be in continuing to advertise if all prices become uniform for the same type of product as proposed by the NRA codes. Some feel that advertising expenditures should be seriously curtailed or even eliminated entirely. That there is a distinct fallacy in this reasoning is not hard to see. If price is no longer the selling appeal, then quality and reputation of the maker must predominate. The more prices become uniform, the more will be the need for identifying that manufacturer, among the many, who is giving a superior quality for the same money. Reputation and good-will are still valuable assets and the buyer who can get the quality product of a well-known manufacturer at the same price as that of one not so well-known is sure to favor the former. NRA therefore does not mean less advertising; it should indicate the need of more advertising to preach recognized quality. As a large advertising agency puts the situation so well, "Codes may do away with many evils—but quality cannot be coded."

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Soviet Recognition

CERTAIN branches of the rubber industry—particularly suppliers of machinery and equipment—are keenly interested in the possibilities of United States recognition of Soviet Russia. Present indications point to the fact that diplomatic relations will be resumed within a short while. A number of manufacturers of rubber machinery enjoyed a substantial business with Russia several years ago and when credit conditions here forced Russia to turn to Germany for equipment and materials, that business was lost to us. Whether or not the volume of business to be obtained in Russia is large, any business which is available will be welcomed by American industry. The whole situation, as far as trading is concerned, rests with the extension of suitable long-term credits to Russia, but it appears that this credit must have been tentatively agreed upon before negotiations were started. It is hard to see, therefore, how anything can prevent this old customer from again trading in this country—to the great advantage of our rubber equipment makers.

CURRENT • NEWS of the Rubber Industry

NOVEMBER, 1933

Tire Industry Code Hearing Reveals Opposition of Labor Unions and Smaller Tire Companies

Hearing Brings Forth Claims of Labor for Shorter Hours—Dealers Ask Prohibition of Sales Direct to Consumers—Viles Upholds Code as Presented

BY GEORGE H. MANNING

(*Washington Correspondent of* THE RUBBER AGE)

WASHINGTON, D. C., October 20—Declaring that the rubber tire industry is unique in that it has at all times been fair to the government, the consuming public and to its employes, and unfair only to its stockholders, A. L. Viles, general manager of the Rubber Manufacturers Association presented a proposed code of fair competition at a public hearing here today which met opposition both from within and from without the industry.

President William Green of the American Federation of Labor led organized labor's opposition to the minimum wage and maximum hour provisions embodied in the projected agreement, while "independents" who professed a production of 25 per cent of all tires made in the country, went on record as opposed to many of the code features.

The National Tire Dealers' Association, through its president, Martin J. Barry of Baltimore, Md., urged that sales by manufacturers direct to consumers be prohibited, adding that he believes every evil which has developed in the industry in the past 10 years has had its germ in this practice. He declared that the dealers, because of their large investment in the business, should have the right and privilege of writing their own code.

Losses of Industry

The hearing opened with Mr. Viles' formal presentation, in which he pictured the industry as one of substantial losses in the past four years. In the face of substantial deficits, he said, the industry will pay $33,000,000 in taxes this year, contributing to a net loss which this year is estimated at $1,029,000, on a sales volume of $764,000,000.

Mr. Viles stated approximately 60,000 persons are employed in rubber tire manufacturing, 56,000 of whom are wage earners. Present wages average from 52.8 cents an hour to 71.5 cents an hour.

Discussing the high costs of operation during the period of economic depression, he quoted from Department of Commerce statistics to show there has been a 50 per cent "mortality" in the rubber tire industry in the past four years. Fewer automobiles being registered and a long-wearing quality product are factors which have cut down tire distribution, he pointed out, and also have led to a highly competitive, and in some instances disastrous, market.

Laying a foundation for the suggestion of hourly differential to meet the peculiar requirements of the industry, the speaker called attention to the fact that there are two peak conditions, one occasioned by replacements and one by original equipment, both of which coincide in the spring. Man-hours in March to June, 1931, a typical year, were double those required per month in November and December of the same year, he said. Anticipating the argument that activity could be spread over the year by building up inventories in the slow months. Mr. Viles said several factors militate against this: Changes in design of automobiles, embodying tire sizes, do not come until late in the year; violent fluctuations in raw material price make building inventories too speculative; absence of earnings has made financing of inventories difficult, if not impossible.

Mr. Viles then submitted the proposed 36-hour week with a tolerance of 104 hours each year, explaining that the 36-hour week is not comparable with average hours previously worked by factory employes. A work week of fewer hours would disturb employment conditions in other industries in the localities where factories are located, and a tolerance as suggested is necessary for building and curing operators, he explained.

As a minimum wage, $14.40 a week of 36 hours, or 40 cents an hour was suggested. This, Mr. Viles contended, based on present costs of living, will restore 1929 purchasing power; in fact, he added, a weekly pay of $11 would accomplish this objective. Against this possible minimum, he advised, only 13 per cent of tire workers were being paid less than 40 cents an hour in May of this year, and two general pay advances have come since that time, to bring the general wage in the industry to 65 cents an hour in August.

Turning his discussion to the matter of competition, Mr. Viles declared a market stabilization, based on uniform cost control, is necessary if the industry is to be saved from destruction. Continuing, he said:

"With the assistance and approval of the administrator a plan could be evolved which will enable the industry to dispose of its products based upon a cost fair to all members and one enabling each member to carry out the purpose as well as the spirit of the NRA.

"Unless such a plan is evolved and made effective, there is apt to ensue a slow but sure disintegration of the structure of the industry."

Pending adoption of a plan and the necessary studies to serve as a basis for it, the industry proposed a temporary arrangement, claimed to be necessary if the principles of NRA are to be carried into effect. The suggestion contemplates creating of four classifications which would permit members with less extensive advertising and distribution to continue to merchandise their products at a lower differential than the larger companies. The classes and the discounts each would be permitted to extend for new business are:

Group A—Members whose 1932 sales were not less than $15,000,000, who would not be permitted to exceed the extreme current maximum standard discounts for

New York Group
XMAS PARTY
December 15

The biggest event of the year will be with us soon—the Xmas Party of the New York Rubber Group! The date selected is Friday—December 15—at the Club Rooms of the Building Trades Employers' Ass'n, 2 Park Avenue. Details of the meeting are being kept a deep, dark secret—only the date being revealed. Those who have attended these parties in the past know what to expect—others should keep that date open and arrange to be present.

the original equipment manufacturer from latest price lists on file with the association; **Group B**—Members whose sales ranged from $6,000,000 to $15,000,000, allowed to extend not more than 5 per cent below the maximum discounts of Group A; **Group C**—Members whose sales ranged from $2,000,000 to $6,000,000, not more than 10 per cent below maximum discounts for Group A; **Group D**—Members with 1932 sales of less than $2,000,000, not more than 15 per cent below Group A discounts.

Edward D. Levy, president of the Fisk Rubber Corporation, offered several amendments which he admitted to be of minor consequence when considered individually but which taken in their larger aspects, would insure better representation on the code authority for "independents" and would not countenance control by the code sponsors. He also protested "artifically multiplying tire lines," a practice which requires dealers to finance several different lines of similar type—the "firsts," "seconds," "thirds," etc. This practice gives the companies with great capital a distinct and unfair advantage over others, he protested, this being true particularly of the company dealers.

Mr. Levy further proposed the establishment of standards for tires with a requirement that each tire be marked in letters a half-inch high, to show its quality under the standard-fixing regulation.

"It is submitted that no honest manufacturer of an article so important to the public safety as an automobile tire can have objection to marking his product with its true grade or quality," Mr. Levy declared.

"No Tire Sold at Loss"

As a substitute for the temporary market stabilization feature of the proposed code, Mr. Levy proposed a regulation that no concern should solicit new business except in accordance with the following provision: No tire or tube shall be sold through any channel of distribution, at a net realized price less than the sum of (a) the amount of the manufacturer's mill door average cost of production, (b) the amount of the manufacturer's average cost of distribution, and (c) 5 per cent of the total of the said two amounts; such costs to be determined in accordance with the approved accounting manual of the Association.

President Green of the American Federation of Labor followed Mr. Levy as a witness, proposing a five-day, 30-hour week for factory help, with a minimum of 60 cents an hour or $18 a week. For many months, he said, automobile manufacturers have been working their employees only 24 hours a week, which is well below labor's recommendation. He stressed the point that 10,000,000 jobless men furnish no market for tires or automobiles, adding: "While appealing for labor, I am appealing for you and for a market for your products." Mr. Green also asked labor representation on the code authority.

C. E. Dunlap, representing the Tube Repair Kit Manufacturers, asked that the code be studied carefully in order that his craft be not included under the tire manufacturing trade when kits are composed of rubber only to a slight degree.

Joining President Green in support of work and wage provisions urged by organized labor, were A. D. Trembley and R. F. Turner of the Goodyear Industrial Assembly; Thomas Burns, president of the Rubber Workers Union at the Fisk plant; and J. H. Dent of the Federal Labor Union.

Representing the Pharis Tire & Rubber Company, Newark, Ohio, James M. Butler presented objection to any form of price fixing or price control. In the matter of prices the industry should not go further than production costs plus a proper margin of profits, he said, contrasting the rubber industry with the "natural resource industries" such as oil, coal and lumber where conservation measures are required, whereas the tire industry presents no problem of conservation. At any rate, Mr. Butler declared, the industry might well wait until it has rid itself of the bad practices admitted in the code and until a proper cost and market stabilization plan can be worked out.

Also opposed to the temporary stabilization plan was R. S. Wilson of the Goodyear Tire & Rubber Co. He made the claim that at the meeting at which this provision was written into the proposed code, 50 per cent or more of the dollar volume of the rubber tire business in 1932 voted against the temporary differential plan. These companies also represent 50 per cent of the employment in the industry, he said. This article, he claimed, is unsound, uneconomic and unbusinesslike and should be scrapped if ruin of the industry is to be averted.

The hearing closed with a general assault against the code by Fred C. Huhlein, consumers adviser for the hearing, who said:—

"The consumers advisory board regards this code as a frank attempt to control manufacturers' prices, fix resale prices, establish uniform discounts and terms without regard to production and distribution costs, and to authorize other practices detrimental to the interests of consumers.

"We oppose all provisions of the code which directly or indirectly sanction price fixing, the maintenance of resale prices, the use of standard contract forms, the establishment of average cost, the publication of scheduled future prices, and all sections which lay the foundation of monopolistic control of prices."

Mr. Huhlein asked that the entire section dealing with the temporary stabilization plan be stricken from the code.

Code Ready for Presentation

Following the public hearing on the tire code and the filing of briefs by those who were heard in opposition to some terms of the code, conferences have been held with K. J. Ammerman, new deputy assistant in charge of the code, on the disputed clauses and it is understood that the revised code was ready for submission to General Johnson. In some quarters it was believed that there is a possibility of another public hearing but it is generally agreed that if any further revisions are necessary they will be made as the result of conferences of industry leaders with General Johnson.

A number of meetings have been held in New York, since the conferences with NRA executives in Washington immediately after the open hearings, and the revised code is the result of those meetings. There have been reports that the "merit clause" is missing in the new code but no verification of this could be obtained.

CHEMICAL EXPOSITION TO OPEN DECEMBER 4

The Chemical Exposition will be with us shortly—in less than three weeks to be more exact. Many rubber technologists make it a practice to attend this exposition to keep posted on new materials and equipment and accordingly a brief summary of the facts in connection with the exposition will serve to act as a reminder to those planning to visit it this year.

Salient Features

Name: Fourteenth Exposition of Chemical Industries.

Time: December 4th to 9th inclusive, 1933; opens Monday at 2:00 P. M. and at 12:00 Noon, each day following. Closes at 10:30 P. M. each evening. Saturday at 6:00 P. M.

Place: Grand Central Palace, New York City.

Attendance: At the last Exposition 102,959 manufacturing executives, chemists, chemical engineers, and others employed in the forty industries comprising the chemical industries attended. There are no tickets sold. Admission is gained only by invitation or registration.

Exhibits Shown: Raw Materials: Agricultural, forest, mineral waste, by-products of manufacture.

Finished Products: Chemicals, dyes, solvents, and such products as plastics, lacquers, varnishes, enamels, and protective coatings to provide water-proofing and acid-resisting characteristics to materials subject to corrosion. Many special products which find application in the Arts, Science, and Industry.

Machinery and Equipment: Materials of construction; machines, equipment and apparatus, for the plant and laboratory. Instruments of precision for control of temperature, pressure, volume, time rate, and flow; also for weighing and measuring. Auxiliary equipment; numerous types of special mechanical equipment; supplies and commodities which may be classed either as utility or service articles.

Educational Exhibits: Comprising the results of most recent research on the part of large industrial organizations, technical organizations, etc.

Professional Sessions: Students Course on the Fundamentals of Industrial Chemistry and Chemical Engineering Practice. Under the chairmanship of Professor W. T. Read, Dean of Chemistry, of Rutgers University. Will be held each morning except Monday, during the week of the exposition. Registration for the Course, Monday afternoon, December 4th. Hours of classes 10:00 A. M. to 1:00 P. M. each day, Tuesday, December 5th through Saturday, December 9th. Admission to classes without charge, but by special registration.

Labor Raises Objection to Hour and Wage Clauses of Rubber Industry Code at Hearing

A 30-hour Week Proposed with Minimum Wage of $18.00 a Week — Plight of Industry Pictured by Viles—Retailers and Consumers Also Heard

BY GEORGE H. MANNING

(*Washington Correspondent of* THE RUBBER AGE)

WASHINGTON, D. C., October 25.—Joined in a master code but with separate sections to embrace trade practices required to cover the peculiar requirements of each unit, nine branches of the rubber manufacturing industry were represented here today in support of a compact to govern their operations under the National Industrial Recovery Administration. The trades included in the proposed agreement are: Automobile Fabrics; Proofers and Backers; Rubber Flooring; Rubber Footwear; Hard Rubber; Heel and Sole; Mechanical Rubber; Sponge Rubber; Rubber Sundries; Rainwear.

Feasibility of joint action by various sections of the industry on labor provisions, A. L. Viles, general manager of the Rubber Manufacturers Association, said, lay in the fact that there is a great degree of similarity in all steps of manufacture, and workers and equipment are used interchangeably in various plants. However, because of the differences in marketing methods each section found it necessary to have its own code of fair trade practices, he said.

Labor raised vehement objection to the wage minima and hour maximum—35 cents an hour and a 40 hour week, in general—and proposed a 30-hour week of five days, with one and one-half pay for overtime work, a minimum of $18 a week for laborers and $25 a week for operatives.

The rubber manufacturing industry, exclusive of tires, was pictured as one which has felt very sharply the results of the economic depression with its 1929 output of $343,000,000 cut to $150,000,000 in 1932, and with employes numbers reduced from 74,000 to 50,000 in the same period.

40-Hour Week Satisfactory

E. O. Upham of the United States Rubber Products, Inc., reported the average work week for August, 1933, to be 38 hours. He expressed the opinion that the 40-hour work week asked in the code would provide adequate earning power, and that before the end of the year the industry would again be employing "the corrected 1929 figure of 65,000 workers. In 1929, he said, the average wage paid by factories in this trade varied from 40 to 82 cents an hour for men and from 20 to 55 cents an hour for women. The comparable range in 1932 was from 29 to 70 cents an hour for men and from 19 to 43 cents an hour for women."

The minimum wage of 35 cents an hour, proposed in the code, was characterized as a compromise which represented a 25 per cent increase in the general minimum of last year. As against this minimum he reported 75 per cent of the industry earned more than 40 cents an hour and 35 per cent earned more than 55 cents an hour last August.

Labor's opposition to features of the code was presented by John D. Nolan, president of the Shoe Workers' Protective Union and by Dr. A. H. Meyers of the Labor Advisory Board of the NRA.

In addition to changes in hours and wage minimum, organized labor asked that payment of wages at the end of each week be required, that posting of rates in departments be mandatory, and that differentials based on sex be wiped out. A further demand was made that in every operation the principle of equal division of work shall be followed and every operative permanently on the payroll shall be given such a share in the work available in slack times as will allow equivalent opportunity for earnings to all employed on similar operations.

Purchase by the employer of such equipment as rubber gloves, aprons, boots, respirators, etc., was demanded on the ground that they constitute industrial and not business expenses.

Proposed also was the formation of safety committees for safeguarding employes against the mechanical, electrical and power hazards of the industry. An important request made by labor contemplates setting up of labor relations boards in each division, comprising one member appointed by industry, one by labor and a third by the President. All questions relating to labor disputes would be referred to this tribunal for adjudication and all matters of proposed change in wage and labor provisions of codes would be initiated therein.

The rubber footwear division, which accounts for nearly 30 per cent of the production of the combined nine groups, was represented by T. J. Needham, who reported 40 per cent of the plants operating in 1929 are dismantled and out of business today. General economic conditions, wider use of automobiles, and clearance of snow in municipalities have contributed to sharp decline in production, while increased imports and lessened exports also have been factors, he said.

This division proposed establishments of standards of manufacture which set the minimum of quality, and proposed classification of outlets, such as mail order houses, department stores, governmental agencies, retailers, etc., and provided discounts on different bases available to each.

To encourage advance buying, thereby permitting operations in factories to continue through slow periods, no change in price which is agreed upon during advance seasons will affect orders already on hand which can be filled within 30 days of the opening of a consuming season. If there is a change in price which advances invoice costs during a consuming season, it shall apply to orders on hand. This, it is contemplated, will encourage placing of orders in off-season as a guarantee against later price advances, thereby aiding the manufacturer, labor, the retailer and the ultimate consumer.

Retailers Object

The National Retail Dry Goods Association, represented by Irving C. Fox, entered a blanket objection to the classification provision which is contained not only in the footwear code, but also in the mechanical rubber division.

The association also asked elimination of a section dealing with sales through jobbers, written into several of the divisional agreements, which would require manufacturers to refrain from doing business with jobbers who do not agree to abide by the standards and trade practices proposed.

Mr. Fox charged this is an effort to write into the footwear code the principles of the Capper-Kelly act on resale conditions. As a further obstacle to its effectiveness he pointed out that jobbers very likely will be governed by their own code under the NRA, rather than by the code of an industry which has not invited them to take part in its formulation.

While differing in some minor particulars, the several sections on trade practice acts for the most part seek the following objectives: Prohibition of secret rebates, discounts, bonuses or commercial bribers; banning of preferential discounts to persons or firms of the same class; prohibiting improper labeling, misrepresentation of products; barring unfair reflection or outright defamation of competitors, their merchandise, trade practices or financial standing.

Collection of data on producing costs, expenses of distribution, etc., and posting of sales prices and terms for the guidance not only of customers, but also for the benefit of other members of the industry, is generally provided.

NRA Recommendations Soon

There have been no further meetings or conferences of industry executives with NRA officials since the open hearings on the rubber code but it is understood that the deputy administrators are preparing a number of recommendations based on the exceptions filed at the hearing and that these recommendations will be presented at a series of conferences to be called during the week of November 13, to the various divisions of the industry as covered by the code.

Machine Shop Code

The public hearing on the Special Tool, Die & Machine Shop Code of Fair Practices was held in Washington on November 2. Fifteen machine shops in the Akron district, comprising all the mold and equipment shops catering to the rubber industry are members of the Special Tool, Die & Machine Shop Institute, 7016 Euclid Ave., Cleveland, Ohio, which organization sponsored the code. Mold and die makers in the Chicago district also united with the Akron and Cleveland groups in the formulation of the code.

AS WE GO TO PRESS . . . . .

Goodyear Buys Fabric Mill

The Connecticut Mills' tire fabric plant at Decatur, Alabama, was purchased by the Goodyear Tire & Rubber Co. on November 10 at a bankruptcy sale. The plant will be reconditioned and placed in operation at once. The property was bought for $251,000 and renovations will cost approximately $100,000. It is expected that between 400 and 500 workers will be employed.

Paper on Factice

At the December 15 meeting of the New York Rubber Group, a paper on "Use of Factice in Rubber Compounding" will be presented by Kingsley Gillespie, president of Stamford Rubber Supply Company.

Tire Fabric Exemption Ended

The National Recovery Administration has announced that, under an executive order of President Roosevelt, the stay of provisions of the Cotton Textile Code permitting tire fabric manufactures to operate three 40-hour shifts weekly terminated on November 13. The temporary exemption from the code provision limiting machine hours to two 40-hour shifts a week was originally granted by the President when he approved the Code on July 15 and was later extended on July 30.

Overman-Goodyear Suit Terminated

The Overman Cushion Tire Co., Inc., Belleville, N. J., will begin increased production of pneumatic tires immediately as a result of the decision of the Supreme Court of the United States handed down on November 6, in which the Court denied a petition for certiorari in the patent infringement suit of the Overman Cushion Tire Co., Inc., against Goodyear Tire & Rubber Co., Inc., subsidiary of the Goodyear Tire & Rubber Co. of Akron, Ohio. The Supreme Court's denial brings into effect a judgment of approximately $1,250,000 against the Goodyear subsidiary.

Judd Heads Goodyear Advertising

L. E. Judd has just been advanced to the position of director of advertising and public relations of Goodyear Tire & Rubber Company. Mr. Judd has been director of public relations since July, 1932, previous to which time he had been editor of the Akron *Times-Press*.

John W. Mapel Dies

The president of Goodyear Tire & Rubber Co. of California, J. W. Mapel, died on November 4 after a long illness. Mr. Mapel joined Goodyear in 1923 as assistant to the president and three years later he was president of the California subsidiary. He was a native of Milwaukee.

Goodyear NRA Support Praised

The advertising policy of the Goodyear Tire & Rubber Company in support of the National Recovery Administration has attracted favorable comment from the office of Administrator Hugh Johnson. Goodyear has given considerable space in its newspaper advertising to the subject of recovery and Charles Michelson, director of public relations for the NRA, has written to President P. W. Litchfield, on behalf of General Johnson, expressing appreciation of his company's cooperation.

"The comments of advertisers who are giving us their constructive support," says Director Michelson in his letter, "are worthy of our best consideration and your cooperation at this point is not only stimulating, but is a vital asset."

Akron Rubber Group Meeting

The Akron Rubber Group is holding its Fall meeting as we go to press. The meeting is being held at the Akron City Club on Monday evening, November 13, the principal speaker being A. L. Freedlander, vice-president and factory manager of Dayton Rubber Mfg. Company. His talk is entitled "My Trip to Europe on the Graf Zeppelin and European Rubber Shop Practices."

Chicago Rubber Group Meeting

The Chicago Rubber Group will hold its next meeting on Friday, November 17 at the College Inn of the Hotel Sherman. The speakers will be Mr. S. Collier, chief chemist, Johns-Manville Corp., Waukegan, Ill., whose subject is "Asbestos and Its Use in the Manufacture of Rubber Goods," and Mr. W. P. Bauer, Managing Director of the Lawyers Legislative League who will discuss "The Benefit of a Code for the Rubber Industry." Reservations may be made with Secretary B. W. Lewis, 365 E. Illinois St., Chicago.

AETNA TO REOPEN OLD FACTORY AT CLEVELAND

After an absence of three years, the Aetna Rubber Company of Ashtabula, Ohio, has decided to reopen its plant at 815 East 79th St., Cleveland, according to an announcement by S. T. Campbell, president and general manager. He explained the provisions of the NRA code, which establishes the same basic wage minimum for Ashtabula as for Cleveland, has made the change expedient. It will mean employment of about 300 men at the Cleveland plant and the retention of about 185 out of the 485 now at the Ashtabula plant, which will continue to manufacture gloves. The principal operations in Cleveland will be the manufacture of battery boxes.

A strike at the Ashtabula plant, called by union officials on October 23 as a result of claims of disregard of priority rights of workers, was settled on November 1 when 350 returned to work.

Distributes Business Chart

An interesting chart showing a Century of Business Progress as indicated by businesss volume and commodity prices from 1830 to date is being distributed by the Cleveland Liner & Manufacturing Co., Cleveland, Ohio, makers of processed liners and linerette, specially prepared separating paper. The chart is printed in four colors and graphically shows every period of prosperity and depression with the corresponding movement of commodity prices. An interesting feature of the chart is that portion covering the next three years, in which it is prophesied that a new era of prosperity will begin late in 1935. A striking similarity is noted in the present uptrend with the periods following the Civil War and World War.

BOSTON RUBBER GROUP HOLDS FALL MEETING

Approximately 100 members and guests attended the annual fall dinner and meeting of the Boston Group, Rubber Division of the American Chemical Society held November 3, 1933, at the University Club, Boston.

Mr. Bradley Dewy, Chairman of the section, presided and introduced the two guest speakers of the evening. Delivering a particularly interesting and timely talk on "The Problems and Opportunities of the Rubber Technologist," Mr. R. P. Dinsmore, Assistant to the Factory Manager of The Goodyear Tire & Rubber Company, recalled some of the problems that in recent years have taxed the rubber technologist. He urged the industry to control the output of its products and be alert always in the creation of new products for he stated only in this way can over-production be checked and labor lay-off averted. He further stated that the introduction of labor-saving devices was not particularly justified at this time, remarking that internal factory troubles are costly and that in many cases lead to labor disturbances. He suggested a possible remedy by strongly recommending that all the staff men obtain a clearer understanding of their own company policy. In closing he also urged for complete unity and harmony within the rubber industry by all manufacturers.

Mr. R. B. Ladoo, prominent consulting engineer and formerly special investigator for non-metallic mineral resources of the U. S. Bureau of Mines, spoke for some length on "The Search for Rubber Fillers." He briefly reviewed his 15 years' experience in the field in search of non-metallic minerals, stating he found about 40 different minerals used as fillers. His recent efforts have been devoted to the design of new fillers for specific uses. This is yet to be accomplished. Recalling his investigation work with the Bureau of Mines, he discovered in many cases the unethical practice of dealers selling defunct mineral products under trick trade names. Actually many of these products had passed out of existence. One specific case revealed a dealer selling eight or ten different grades where an analysis proved he had exactly but three grades. Today, he claims, factories equipped with better laboratories know what they want instead of being sold a product with a trick name. He predicted that the time is coming when a large number of materials now overlooked may be used for certain fillers and that also many by-products now wasted in all probability will be converted into fillers.

Klauss Withdraws from India

W. G. Klauss, former president of India Tire & Rubber Co., Mogadore, Ohio, withdrew from all activities of the company late last month. At the same time L. V. Baker, former treasurer, withdrew. Receiver Paul C. Weick, Sales Manager C. T. Morledge and Factory Manager John Fisher remain.

Mr. Klauss declared that he saw little possibility of composing the differences of the several factions holding claims against the company, and accordingly decided to drop out of the picture. During the past year he had headed a Mogadore group seeking to purchase the plant but the offer of $600,000 was not acceptable. The plant is said to be operating at a profit.

OHIO-MICH. REGION A.C.S. MEETING HELD IN AKRON

Over 300 members and guests attended the Tenth Annual Meeting of the Ohio-Michigan Region, A.C.S. held in Akron, October 13 and 14.

The members heard A. H. Compton, professor of Physics at University of Chicago, speak at the banquet Friday evening, on "Looking at the Atom With X-Rays." Preceding Doctor Compton's talk members and their guests enjoyed music furnished by the Akron Institute Trio and the Zion Lutheran Choir. Almost four hundred people were present at the banquet.

Among the papers presented at the sessions was one on "Plantation Rubber" by George Sackett, Goodyear Tire & Rubber Company. The paper discussed the effect of various factors in the manufacture of smoked sheet rubber on the rate of cure of the finished product as shown by tests using a "pure-gum" type of stock accelerated with captax.

Inspection trips to the major industries of the Akron district, including the Anaconda Zinc Co., Firestone Tire & Rubber Co., B. F. Goodrich Co., Goodyear Tire & Rubber Co., and the Goodyear Zeppelin Corp., were made Friday afternoon. Those not taking inspection trips enjoyed rounds of golf at the Portage Country Club.

A luncheon was given Saturday noon at the Akron City Club with James H. Doolittle, director of aviation, Shell Petroleum Corp., as the guest of honor. Major Doolittle spoke on his recent trip to the Orient, comparing aviation there and in this country. Vocal entertainment was furnished by Mrs. Jessica Freeman, accompanied by Mrs. Nan Brock.

Among the members of various committees in charge of the meeting were the following well-known rubber technologists: G. K. Hinshaw (Goodyear), A. W. Carpenter (Goodrich), Harold Gray (Goodrich), George Oenslager (Goodrich), H. F. Palmer (Xylos), C. R. Park (Firestone), N. A. Shepard (Firestone), H. E. Simmons (University of Akron), J. N. Street (Firestone), W. W. Vogt (Goodyear).

Faultless Elects Officers

S. R. Finley was elected vice-president of the Faultless Rubber Company, Ashland Ohio, at the meeting of the board of directors on October 14. Mr. Finley recently resigned as division manager of the Ohio Public Service Company in Ashland. Other company officials, named by the board are T. W. Miller, renamed president; Marcell Kauffman, vice-president; Vernon L. Miller, factory manager. George A. Meiler, secretary and treasurer, and R. C. Johnson, assistant secretary.

United Rubber Leases

A newly formed concern, The United Rubber Manufacturing Company, is reported to have leased the plant in Lisbon, Ohio, formerly occupied by the Salem Rubber Company. It is believed that mechanical goods and drug sundries will be manufactured.

India Control Passes to Dunlop

The proposed scheme under which the control of the India Tyre & Rubber Co. (Great Britain), Ltd., would pass over to Dunlop Rubber Co., Ltd., as reported in the October issue of THE RUBBER AGE, was submitted to a meeting of India stockholders in Glasgow on October 26, and the plan as proposed was adopted by a large majority. This step means that virtual control of India Tyre will be in the hands of Dunlop but there is no intention of lessening the individuality of India for it will continue to make India tires at its plant at Inchinnan, Scotland, and will maintain its own sales organization.

RUBBER SECTION N. S. C. MAKES SAFETY AWARDS

At the annual meeting held in Chicago on October 2 and 3, the Rubber Section of the National Safety Council, in addition to electing new officers and an executive committee, made its awards to winners in its annual safety contest. Among the larger plants, first place went to the National India Rubber Co., Providence, R. I., second place to N. Y. Belting & Packing Co., Passaic, N. J., and third place to I. R. Glove & Shoe Companies, Naugatuck, Conn. In the second division, which includes the smaller plants only, first prize was won by Fabric Fire Hose Co., Sandy Hook, Conn., second place went to Canadian Goodrich Co., Kitchener, Ont., and third place to Pacific Goodrich Rubber Co., Los Angeles, Cal.

New officers elected were: General Chairman—H. W. Low (Miller); Vice-Chairman in Charge of Program—B. F. Gerpheide (Goodyear); Secretary—A. M. Dietz (Pennsylvania Rubber).

The safety papers presented at the meeting were as follows:

"Respiratory Protection for Dust and Fumes in the Rubber Industry," by J. M. Lewis, Mine Safety Appliance Co., Cleveland.

"Is the Rubber Industry Making Progress in Accident Prevention?", by R. W. Morse, Director of Workmen's Compensation Dept., Firestone Tire & Rubber Co., Akron.

"Time Study and Safety" by C. L. Hungerford, Firestone Tire and Rubber Co.

"The Safe Use of Carbon Tetrachloride in the Rubber Industry," by Leon J. D. Healy, Consulting Chemist and Engineer, Milwaukee.

"Paying Dividends on the Accident Prevention Dollar," by E. W. Beck, Supervisor of Safety, U. S. Rubber Company.

In addition to the papers which were read, slides were shown by members of Corduroy, Goodyear and U. S. Rubber Reclaiming Co., illustrating a number of new Safety Kinks. A motion picture showing the manufacture of tennis balls was also given through the courtesy of Pennsylvania Rubber Company.

Firestone Sales Conference

Over 1000 district managers, store managers, salesmen and factory officials attended the annual sales conference of the Firestone Tire & Rubber Company, held this year during the week of October 9 in Chicago. On the first day the entire group paraded through the Fair grounds to the Firestone Building. On the following days of the week, several business sessions were held, with time allowed for inspection of the World's Fair exhibits.

Goodyear Plans Power House

Permits for a power house, to cost $20,000, and a water softener building, to cost $4,000, was issued recently to Goodyear Tire and Rubber Co., Akron, Ohio. Construction work was started several weeks ago. Equipment for the buildings will bring the total investment to $504,000, Goodyear officials estimated.

RUBBER CONSUMPTION DOWN IN SEPTEMBER

Consumption of crude rubber by manufacturers in the United States for the month of September amounted to 35,686 long tons, which compares with 44,939 long tons for August this year, and represents a decrease of 20.6% under August and 49.6% over September a year ago, according to statistics released by The Rubber Manufacturers Association. Consumption for September 1932, was reported to be 23,847 long tons. Consumption for first nine months 1933 amounted to 315,533 long tons as compared with 268,468 long tons for same period 1932.

Imports of crude rubber for September were reported to be 47,352 long tons, an increase of 5.7% over August and 60.5% above September 1932.

The association estimates total domestic stocks of crude rubber on hand September 30 at 334,637 long tons, which compares with August 31 stocks of 325,418 long tons. September stocks show an increase of 2.8% as compared with August of this year, but were 3.3% below stocks of September 30, 1932.

The participants in the statistical compilation report 54,525 long tons of crude rubber afloat for the United States ports on September 30 compared with 53,084 long tons afloat on August 31 this year, and 46,188 long tons afloat on September 30, 1932.

September reclaimed rubber consumption is estimated to be 7,727 long tons, production 10,435 long tons, stocks on hand September 30, 15,869 long tons.

RUBBER RESTRICTION ADHERENTS OPTIMISTIC

The activities of both British and Dutch interests continue to seek a solution to the problem of restriction. Committees are appointed, meetings are held, views are aired in the press, but little of definite results is actually known. At the moment there is optimism in Amsterdam over a meeting in Batavia on November 22, of governors of the rubber districts in the Dutch East Indies. It is understood that the principal aim of the meeting is to measure the difficulties of the native rubber problem.

Early last month the Rubber Growers' Association announced in London the appointment of a committee of fourteen to discuss all phases of restriction. It is stated that the committee is representative of all shades of opinion, some members favoring restriction, some are lukewarm and others being against any form of control.

A sharp reminder of the realities in connection with rubber restriction, states the London *Statist*, was issued on October 2 by Sir Cecil Clementi, Governor of the Straits Settlements, who set forth the numerous principles which would have to be observed if a restriction scheme were to commend itself to the Malayan administration. He stated in unmistakable language that no move would be made by the Malayan authorities until a practicable scheme had been evolved by the Dutch for dealing with the output of the Dutch East Indies, where the difficulties of limiting native output constitute one of the main obstacles to any comprehensive regulation of the world's rubber supplies. Even were such a scheme to be forthcoming, the co-operation of Belgian and French controllers of rubber estates would also have to be assured.

OBITUARIES

Charles H. Russell

Charles H. Russell, 39, manager of the national accounts division of The B. F. Goodrich Company truck and bus tire department died suddenly in Chicago early Wednesday morning, October 25, following a heart attack. Mr. Russell, well

CHARLES H. RUSSELL

known throughout the industry, was on a business trip. He complained of pain Tuesday evening retiring to his hotel room where he was found by a member of the Chicago Goodrich organization.

Mr. Russell was born near Creston, Ohio, May 27, 1894 and after his graduation from high school and business college joined the Miller Rubber Company in June, 1915. He enlisted in the United States Army Air Service at the outbreak of the World War and was commissioned as a flying officer, returning to Miller after the armistice. In 1930 he was transferred to the Goodrich truck and bus tire department and in May, 1932 was made head of the national accounts division.

He is survived by his widow, Myrna L. and four daughters, Marion, Erline, Virginia, and Margaret Irene, his mother, Mrs. Flora Russell of Wooster, Ohio, a sister, Mrs. R. D. Whitmore of Medina and two brothers, T. M. Russell of Texas, and Earl Russell, Wellsville, Ohio.

Samuel S. Wilson

Samuel S. Wilson, superintendent of the Welland plant of the Joseph Stokes Rubber Company of Canada, Ltd., passed away on October 21. Mr. Wilson appeared to be in his usual excellent health until Thursday, October 19, when he was stricken with an acute attack of appendicitis.

Mr. Wilson was born in Trenton, N. J., in 1894 and received his education there. He first became associated with the Stokes Rubber Company at their Trenton headquarters in 1913 and except for a period when he was in the World War, he had been with the Stokes company until the time of his death. He served overseas with the 78th Division of the 311th United States Infantry and was a member of the American Legion.

Mr. Wilson went to Welland in April, 1921, on the establishment of the Canadian Stokes company and soon became highly popular as an executive and a citizen. He was keenly interested in many branches of sport.

Charles R. Rinehart

Charles R. Rinehart, vice-president and sales manager of the Overman Cushion Tire Company of New York, died October 30 in St. Luke's Hospital, New York City. He was in his fifty-eighth year and resided in Maplewood, N. J. He was born in Phillipsburg, N. J. Mr. Rinehart was graduated as a civil engineer in 1897 from Lafayette College. He was considered one of the noteworthy football guards in the United States. He was captain of his team in his graduation year and was selected as an all-American guard. He worked as an engineer in Michigan, Pennsylvania, New York, Georgia, Arizona and Mexico. He joined the tire company several years ago.

Active in Masonic circles, he was a member of Maplewood Lodge, F. and A. M. He was a charter member and Past High Priest of Maple Chapter, Royal Arch Masons, and Past Grand High Priest of the Grand Royal Chapter of New Jersey. His other memberships included the Engineers Club of New York the Baltusrol Golf Club, Maplewood Country Club, Delta Upsilon and the Whitehall Club of New York.

He is survived by his widow, Mrs. Lena Smith Rinehart.

James Penrose

James Penrose, who retired four years ago after 52 consecutive years of service with the United States Rubber Co., Naugatuck, Conn., and its predecessors, died October 27 in Naugatuck. For many years he was foreman of the cutting departments of the U. S. Rubber Naugatuck plants.

Frank Whitehead

Frank Whitehead, 69 years old, of Yardville Heights, N. J., former salesman for the Whitehead Brothers Rubber Co., Trenton, committed suicide in September by shooting himself at his home. He had been despondent through a long illness. He is survived by his wife. Mr. Whitehead's family founded the Whitehead Brothers Rubber Co.

C. R. Schermerhorn

Charles R. Schermerhorn, of New Hope, Pa., for fifty years connected with the Lambertville (N. J.) Rubber Company, died September 25th in the 79th year of his age. He had been a widower for several years. Burial was in Lambertville, N. J.

PERSONALS

WILLIAM HOOVER, consulting engineer of all the asbestos and rubber companies in Russia, recently returned to his home in Akron for a month's visit. Commenting on the rubber situation in Russia, Mr. Hoover said, "We make more truck tires in Russia than Goodyear, Goodrich and Firestone combined. Our Leningrad factory exports tires to many places in Europe. We turn out 800,000 rubber soles and heels a day. In one factory 200,000 pairs of rubber soles, wool-lined or felt-lined are turned out a day, in another 850,000 pairs. Our mechanical plants and equipment are very up-to-date. All of our labor is Russian and 40 per cent are women."

WILLIAM O. RUTHERFORD, president of the Pennsylvania Rubber Co., is recovering from injuries suffered when he was struck by an automobile at the airport in Akron last month while awaiting arrival of the Graf Zeppelin.

F. A. SEIBERLING, president of the Seiberling Rubber Company, is a new trustee of the McKinley Memorial association, following the annual meeting of the association held last month at Canton, Ohio. Mr. Seiberling succeeds Jerome K. Zerbe, who died last year.

L. M. SIMPSON, general sales manager, tire department, United States Rubber Company, announced the appointment of J. C. RAY as manager of the automobile tire department, dealer sales. Mr. Ray formerly was manager of the regional office in Chicago. His headquarters now are at New York.

GORDON C. MACK has recently been added to the Patent Department of Goodyear Tire & Rubber Co. where he will specialize on patent matters of a chemical nature. Mr. Mack had previously been connected with Pennie, Davis, Marvin & Edmonds, patent attorneys of New York.

H. L. FISHER, of the development department of the U. S. Rubber Company, general laboratories, in Passaic, N. J., addressed the Delaware Section of the American Chemical Society at Wilmington on October 18 on the subject, "True Stories of Some Rubber Inventions."

FLOYD S. COATS, formerly of the Carter White Lead Co., and the National Lead Company, is now associated with D. H. Litter Co., New York City, manufacturers' agents for pigments, colors and solvents.

GOODYEAR ACCUSED UNDER CLAYTON ACT

A complaint, filed in September but only made public in Washington on October 18, was issued by the Federal Trade Commission against the Goodyear Tire and Rubber Company charging violation of the Clayton Act in price discriminations favoring Sears, Roebuck & Co. The case involves alleged practices said to have caused a long price war between mail-order houses and other tire dealers.

P. W. Litchfield, president of Goodyear declared in a statement that he welcomed the inquiry, adding that "when the case comes up for hearing we expect to prove that no law has been violated and that our stockholders, our dealers and thousands of employees directly engaged in the production of Sears tires have been greatly benefited" under the contract between the two companies.

"The Goodyear-Sears contract has for several years been the subject of a great deal of publicity," continued Mr. Litchfield's statement, "and the objective of an anti-mail order campaign directed at our dealer organization. We welcome opportunity to have the facts aired and settled once and for all.

"It is alleged that the terms of the contract tend toward the creation of a monopoly in the tire business for Sears. As a matter of fact, during the seven years of the contract's existence the percentage of the total tire business enjoyed by Goodyear dealers with Goodyear brand tires has increased 45 per cent."

Hearings are scheduled to be held in Washington on December 4, according to latest advices.

NEW ENGLAND NEWS

The Badger Rubber Works has been incorporated in Chicopee Falls, Mass., to operate as a subsidiary of the Fisk Rubber Corp. The new corporation supplants a Wisconsin concern of the same name which is being liquidated. The new Massachusetts company is authorized to issue 5,000 shares of stock of no par value. Incorporators are George E. Whitelam, Whitfield Reid and Mary B. Wimber.

E. M. Bogardus, connected with the old Fisk Rubber Co., for 35 years, serving as vice-president and comptroller and lately as agent for the receivers, left the organization in October, having completed his work in connection with the liquidation of the old corporation. Mr. Bogardus became receiver's agent upon the resignation of Edmund S. Burke last April 10. He joined the Fisk Rubber Corp., when it was founded in 1898.

The weekly payroll of the H. O. Canfield Co., Bridgeport, Conn., manufacturers of plumbers' supplies and rubber specialties of all types, amounting to $6,700, was stolen October 30 by two bandits who held up and kidnapped H. Archibald Mayse, treasurer, and Stephen R. Tomlinson, assistant treasurer. The bandits boarded Mr. Mayse's own car as he entered the factory driveway. One took the driver's wheel while the other kept Mr. Mayse and Mr. Tomlinson covered from the rear seat. They drove to a secluded spot in Trumbull, a suburb, where the executives were robbed of their personal belongings as well as the payroll, then left, bound and gagged, in the car. After 45 minutes of struggling, the victims broke their bonds, drove to a police station and turned in the alarm. The robbers escaped. The loss was covered by insurance.

Mr. Tomlinson died November 6 of a heart condition said to have been aggravated by excitement attendant upon the holdup and kidnapping. He was 63 years old and had been assistant treasurer of the H. O. Canfield Company for 15 years. Prior to that he had been paymaster of the American Tube & Stamping Co., Bridgeport, for 25 years. His wife and his mother survive him.

A strike of workers affiliated with the Insulated Wire Workers' Union of the A. F. of L. was called at the plant of the Whitney-Blake Co., Hamden, Conn., October 15. Operations continued in the plant, however, with little trouble, although picketing was carried on extensively. Union officials charged that a number of employees had been discharged for affiliating with the union, and demanded recognition under the NRA. The questions of wages or hours were not involved, it was stated.

An attempt of unknown agitators or union agents to win the attention of workers in the plant of Goodyear Rubber Sundries, Inc., New Haven, on October 23, failed when the speakers were drowned out by a chorus of boos and jeers.

A storage building owned by the Duro-Gloss Rubber Co., New Haven, Conn., formerly the J. C. Haartz Mfg. Co., was damaged by fire October 17. Two alarms were turned in for the blaze, which resisted efforts of firemen for more than an hour before being brought under control.

The Sponge Rubber Products Co., Derby, Conn., has started an intensive advertising campaign to promote its new line of "Spongex" seat cushions and fillers. The company is aiming its campaign chiefly at bus and truck fleet owners, in which field it has already been successful in developing a large market for the rubber-filled cushions.

Wesley I. Charter, chairman of the board of the National Sherardizing & Machine Co., Hartford, Conn., has been elected president to fill the vacancy caused by the death several months ago of A. F. Schoen. Frank F. Schoen, vice-president, has been named general manager while retaining the vice-presidency. W. B. Umberfield and John F. Forward continue as treasurer and secretary respectively.

F. Thatcher Lane, vice-president of the Seamless Rubber Co., New Haven, Conn., became general manager of the company on November 1, taking over the duties from F. O. Williams, president. He retains the vice-presidency, and Mr. Williams continues as president. Mr. Lane was born in New Haven and was graduated from Yale University in 1917. After serving in the army overseas he joined Seamless and in 1922 became sales manager, being promoted to vice-president in 1930.

Harry B. Kennedy, head of the Hoggson & Pettis Mfg. Co., New Haven Conn., has been elected a director of the newly-organized Manufacturers' Division of the New Haven Chamber of Commerce. His term will be two years.

The Habirshaw Cable & Wire Corp., Yonkers, N. Y., is now working at its 1928-29 rate of production, and will continue operating at this capacity at least until mid-winter, according to Earle Mitchell, superintendent. On November 1, the Point street plant of the company employed 320 men on a 36-hour week schedule, comparing with an average of 325 during 1928 and 1929. Two large orders for cable and wire to be used on Federal projects have helped to maintain the present schedule.

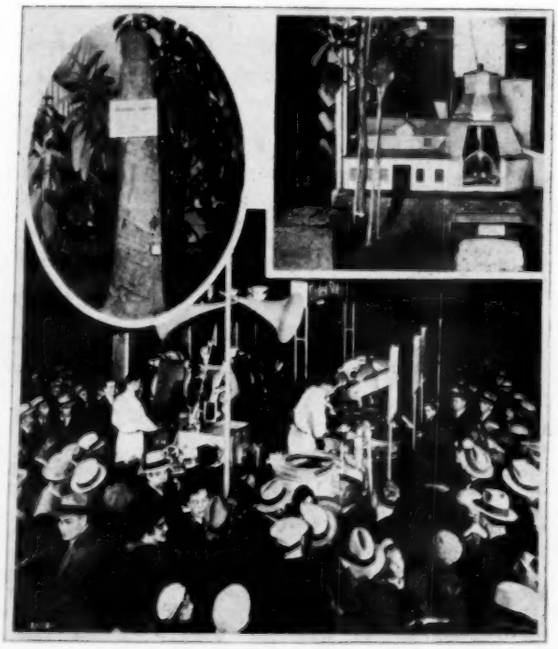
Construction work on the proposed addition to the plant of the Armstrong Rubber Co., West Haven, Conn., has been postponed until next spring. Plans call for a structure 80 x 180 feet, two and three stories high, of fireproof construction.

The Goodyear Rubber Co., Middletown, Conn., manufacturer of rubber footwear, has started minor alterations to its plant designed to improve shipping and handling facilities. Harold S. Guy is president and C. M. Park, treasurer and general manager of the concern.

Property of the Goodyear Tire & Rubber Co., in Goodyear, Conn., a section of the Town of Killingly, was formally transferred October 30 to F. A. Powdrell, president of Powdrell & Alexander, curtain manufacturers, and in turn transferred by him to The Powdrell Associates, Inc., a new corporation. The property includes a large mill building, a seven-story concrete stockhouse, power plant, hotel, and about 200 tenements. The mill was for many years used by Goodyear in the manufacture of tire fabric.

William R. Todd, treasurer of The Sponge Rubber Products Co., Derby, Conn., is convalescing after an operation for appendicitis performed at the Waterbury, Conn., General Hospital.

U. S. Tire Display



Views of a part of the United States Rubber Company's display in the Ford Exposition of Progress held recently in Detroit. The U. S. exhibit told the story of rubber from plantation to finished tire. Oval shows trunk of matured rubber tree from company plantation in Sumatra. Square shows miniature of sprayed rubber mill. Small rectangular inset shows piece of rubber after it has been sprayed. Large view presents typical throng of visitors around the tire exhibit.

New Rubber Goods

Ne-Flex Stocking

The latest thing in stockings, just introduced by Brown Durrell Co., New York City, is a hose with an insert of lastex just above the knee. What it does to the stockings is to give them flexibility at the knee—no more wrinkles and no more runs, because the flexible insert lets the stocking respond to every movement and position of the leg and the strain is distributed evenly. It helps the fit, too, and takes away those little bulges at the top. The appearance is no different from ordinary stockings, the lastex feature being knit as part of the stocking cannot be distinguished from the usual reinforcement.

New Goodrich Storage Battery

The "Electro-Pak," an automobile storage battery of distinctive and unique new design, is announced by The B. F. Goodrich Company, Akron, Ohio. Manufactured in sizes for all popular makes of cars, the battery unit is entirely encased in a hard rubber protective cover of modernistic design. This is said to be the first time this type of construction has been used on an American made battery.

With all the formerly exposed metal parts of the battery completely covered, the new cover protects against dirt, acid fumes, moisture and metal dropping across the terminals, thus preventing short circuits and greatly reducing corrosion and power leakage, deadly enemies to battery life.

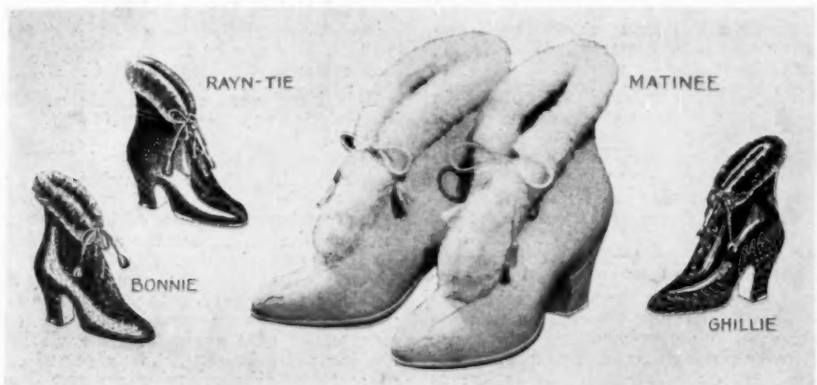
Goodrich "Electro-Pak" Battery

The "Electro-Pak" is serviced, when replacement of water is needed, without removing the protective cover. The case is sturdily built with uniform wall thickness throughout, unlike other battery case construction.

New Fur Trimmed Galoshes Introduced

An innovation in women's galoshes was announced last month when the Cambridge Rubber Company, Cambridge, Mass., restyled some of its well-known gaiters by the addition of lacing instead of fasteners and by adding fur trimming on the cuffs. Four of the new models are illustrated herewith. The laced pattern models couple smart design with practical convenience states the manufacturer. The gaiters are said to go on easier and faster, no unlacing is necessary, they adjust themselves to all ankles and have waterproofed corded laces.

The models with fur cuffs are said to be in step with the new trend toward femininity in costume. The fur is waterproofed by a special process which prevents it from getting mangy looking. The fur excludes rain and snow from the shoe.



Several of the New Cambridge Galoshes

AUGUST TIRE SALES SHOW 14.4% DECLINE

Shipments of pneumatic casings for the month of August amounted to 4,707,085 casings, a decrease of 14.4% below July but was 77.3% above August, 1932, according to statistics released by the Rubber Manufacturers Association, Inc. Production of pneumatic casings for August was 4,993,609 casings, a decrease of 12.6% under July but was 61.6% above August 1932. Pneumatic casings in the hands of manufacturers August 31 amounted to 7,069,574 units, an increase of 3.3% as compared with July 31 stocks and 6.2% above stocks August 31, 1932. The actual figures are as follows:

Aug. 1933 ..	4,707,085	4,993,609	7,069,574
July 1933	5,497,191	5,713,626	6,844,006
Aug. 1932 ..	2,654,863	3,089,201	6,658,974

Auto Production Down

September factory sales of automobiles manufactured in the United States (including foreign assemblies from parts made in the United States and reported as complete units or vehicles), based on data reported to the Bureau of the Census, consisted of 196,082 vehicles, of which 160,891 were passenger cars, 35,182 trucks, and 9 taxicabs, as compared with 236,487 vehicles in August, 84,150 vehicles in September, 1932, and 140,566 vehicles in September, 1931.

TRENTON NEWS

More than 500 employees of the Essex Rubber Co., Trenton, were recently granted a 5 per cent raise in wages by Harold S. Maddock, receiver. The receiver promised another boost during the winter if prices of Essex products have advanced at that time to warrant it. Mr. Maddock told the employees that the output of the Essex Company has been affected in recent weeks by labor troubles in the shops of a number of large shoe manufacturers. Essex has been operating day and night for some time.

The members of the Rubber Manufacturers' Association of New Jersey recently held their annual outing and dinner at the Longacres Country Club at Lawrenceville. John A. Lambert, treasurer of the Acme Rubber Mfg. Co., is president of the association.

Joseph Stokes Rubber Co., Trenton, is adding a new two-story brick building, 80 by 120 feet, to the main plant, and also additions to the shipping and storage departments. The company recently completed a new manufacturing building, 60 by 100 feet.

Accurate Mfg. Co., of 44 Hepworth Place, Garwood, N. J., has been incorporated at Trenton with 1,000 shares of preferred stock and 10,000 shares of common stock to manufacture various kinds of rubber goods. A. DeMattia and William O'Brien, of Clifton, and Mildred Rubenstein, of Passaic, are the incorporators.

J. Edward Myers, superintendent of the Acme Rubber Mfg. Co., Trenton, has been made a member of the Trenton NRA compliance board of the National Recovery Administration.

FINANCIAL NEWS

Goodyear

Goodyear Tire & Rubber Co., has declared a dividend of 50 cents a share on the 7 per cent preferred stock payable Jan. 1 to stock of record Dec. 1 on account of accumulations, which will amount to $5.00 a share after this distribution.

Fisk

Fisk Rubber Corp., and subsidiary Companies showed net income of $533,851 for the quarter ending September 30, making a total net income of $725,130 for the period from May 20 to September 30. Gross sales for the quarter were $3,031,659 and for the May 20-Sept. 30 period, $4,367,447. A loss of $66,640 and $41,954 was shown for the same periods on the Fisk export accounts in liquidation.

Firestone

Common stock dividend of approximately $200,000 was made on October 20 by Firestone Tire & Rubber Company. This represented 10 cents per share on all outstanding common stock. The regular quarterly dividend of $1.50 a share on Firestone 6% preferred stock was declared on November 4, payable December 1 to stock of record November 15.

Monsanto

The Monsanto Chemical Company reports third quarter net earnings of $680,757, equivalent to $1.57½ a share, compared to 47 cents a share earned in the same quarter last year. The current nine months earnings were $1,519,704, or $3.51½ a share, compared to $736,042, or $1.71½ a share for the same period in 1932.

According to Edgar M. Queeny, President, the third quarter earnings are the best in the company's history. He stated, however, that they do not reflect higher wage rates and higher raw material costs now in effect or in prospect.

Earnings for the quarter permitted retirement in anticipation of maturity of $200,000 of the company's bonded indebtedness. In the current nine months period, the company's net property account has increased more than $600,000 and its investment account more than $750,000. Reserves for depreciation increased $555,000.

L. J. SCHOTT CO.
P. O. BOX 124, E. AKRON STAT.
AKRON - - - - OHIO

Buyers of Surplus and Obsolete Rubber Chemicals, Colors, Fabrics, &c.

REVIEW SHELF

• Monthly Review of New Books, Pamphlets, Company Catalogs, Service Bulletins, House Organs, etc., Pertinent to the Industry.

CHEMICAL AND ENGINEERING ADVANCES IN THE RUBBER INDUSTRY, by George Oenslager, B. F. Goodrich Co., Akron, Ohio. Reprint of chapter from "Twenty-Five Years of Chemical Engineering Progress," Silver Anniversary Volume of American Institute of Chemical Engineers. Published by D. Van Nostrand Co., New York City. 387 pp. Price $4.00.

Under the following captions the author reviews briefly the advances made in the rubber industry since the first systematic attempt to obtain rubber by cultivation of rubber-bearing trees was made in 1876: Crude Rubber; Accelerators of Vulcanization; Age Resisters in Vulcanized Rubber; Cotton Fabric; Rubber Compounding and Product Design; Industrial Uses for Rubber Latex; Mechanical Equipment; New Engineering Uses for Vulcanized Rubber; Summary of Past Developments. The reprint also contains several charts and tables.

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A HANDBOOK OF N. R. A. Published by Federal Codes, Inc., New York and Washington. Price $4.50, including supplement service to Dec. 31, 1933.

This book is a compilation of all Statutes, Executive Orders, Regulations, Official Interpretations, Decisions, Approved Codes, Approved Modifications of Blanket Code and Official Statements relative to the National Industrial Recovery Act and Administration, together with Editorial introductions and footnotes. In addition it contains in full every approved or partially approved code of fair competition, eighteen in number, the so-called blanket code, and the substitutions for certain provisions of this code approved for some 125 industries.

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A GUIDE TO THE LITERATURE ON RUBBER. Letter Circular LC 305, Revised, September 20, 1933. Distributed without charge by the Bureau of Standards, Department of Commerce, Washington, D. C. 14 pp.

This letter circular has been prepared in response to inquiries about sources of information on rubber. It is intended to assist the reader who may be unfamiliar with rubber technology in obtaining recent and authentic information relating to the production, manufacture and properties of rubber and rubber products. There has been no attempt to make a complete or exhaustive survey of the field of rubber literature, but rather the aim has been to point out those recent books, current periodicals and other publications which are likely to be readily accessible and most useful to American readers. Only casual reference is made to the patent literature since patents are seldom useful as sources of information. The contents are as follows: I. Books on rubber; II. Reviews on rubber; III. Periodicals devoted primarily to rubber; IV. Abstracts of publications on rubber; V. General periodicals in which some papers on rubber are published; VI. Special publications on rubber.

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THE VANDERBILT NEWS. September-October, 1933, Volume 3, No. 5. R. T. Vanderbilt Company, New York City. Paper cover. 30 pp.

This issue is devoted entirely to an enlargement of the paper on "Effect of Temperature on the Tensile Properties of Vulcanized Rubber" which Drs. Somerville and Russell presented at the September, 1933, meeting of the Rubber Division, A.C.S., in Chicago. Tests on tensile properties of various types of auto tubes at different temperatures and before and after aging are described fully, as well as the effect of various sulfur ratios on tensile properties.

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1933 CHEMICAL ENGINEERING CATALOG. Eighteenth Annual Edition. Published by The Chemical Catalog Co., New York City. 8 x 11. 789 pp.

This latest edition contains the usual data on equipment, supplies, and materials used in the industries employing chemical processes of manufacture. Included also is a technical and scientific book section, cataloging and briefly describing a practically complete list of books in English on chemical and related subjects. This edition maintains the high standards set by previous issues and is indispensable in locating sources of process equipment and supplies.

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PUBLIC HEALTH REPORTS. Issued weekly by the United States Public Health Service. Volume 48, Number 32, August 11, 1933. For sale by the Superintendent of Documents, Washington, D. C. Price 5c.

This issue contains an article on "Zinc in Relation to General and Industrial Hygiene" by C. K. Drinker, M.D., and L. T. Fairhall, Ph.D., of Harvard School of Public Health, which, although it does not cover zinc in the form used in rubber compounding, is nevertheless of interest to the rubber industry because the authors help to dispel any doubt that may exist on the toxicity of zinc or its compounds. Zinc Oxide, on account of the fineness of its particles may cause some irritation, but not on account of the zinc content which in itself is not poisonous. The reported cases of so-called zinc poisoning are not due to the zinc but to the contaminating metals in ores such as lead, arsenic, antimony or cadmium.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, NOVEMBER 9, 1933

Crude Rubber

DURING the whole month of October spot crude held firm and varied little, ranging from 7 to 8 cents with an average of 7.635 as compared to 7.30 for September. Since the end of the month, however, quotations have risen steadily from 7¾ on October 31 to 8⅞ on November 9, and there appears little to stop the rise short of 10 cents within the next few weeks. The exchange quotations followed the above outside prices closely, with trading becoming active early this month. Today for instance 11,590 tons were traded compared to the usual 5,000 tons. The current rise is attributed to the decrease in the value of the dollar, a rise in sterling, and the possibility of some form of restriction. There is a belief that restriction is in the offing—and the market reflects the attitude of traders both here and abroad. The meeting on Nov. 22 in Batavia is expected to produce some definite results, especially as compared to the lack of information on meetings of British and Dutch interests held in Amsterdam and London. Quotations on the outside market, Commodity Exchange, London and Singapore, follow:

Plantations—

Ribbed Smoked Sheets—			
Spot	—	@	.08¼
November	—	@	.08¼
December	—	@	.08⅛
First Latex, crepe spot	—	@	.09¼
Amber Crepe, No. 2	—	@	.06¼
Amber Crepe, No. 3	—	@	.06⅛
Amber Crepe, No. 4	—	@	.06
Brown Crepe, clean thin	—	@	.06¼
Brown Crepe, rolled	—	@	.05⅛

Latex—

Liquid Latex, per gal.	.72	@	—

Paras—

Up River, fine	.08	@	—
Acre Bolivian, fine	.08¼	@	—
Caucho Ball, Upper	.07½	@	—

Balata—

Block, Ciudad	—	@	.25

LONDON MARKET

Standard Smoked Sheets—Buyers—Nov. 9

November	—	@	4 5/32d
Jan.-Mar.	—	@	4 7/32d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—Nov. 9

November	—	@	3 3/32d
Jan.-Mar.	—	@	3 5/32d

Reclaimed Rubber

Production of reclaim is holding up well in keeping with demands. Reclaimers look for a continuation of fair production schedules for the balance of the year. Prices are practically unchanged, the only changes being a lowering of a half cent on truck tires and selected white. With the unsettled crude market, which has been rising of late, reclaims are expected to advance. Current quotations follow:

High Tensile

High Tensile Red	.06½	@	.06¾
Super-Reclaim Black	.07	@	.07½

Shoe

Washed	.08	@	.09
Unwashed	.06½	@	.06¾

Tube

No. 1 (Floating)	.11	@	
No. 2 (Compounded)	.06¼	@	.06½

Tires

Black	.04¾	@	.05
Black, selected tires	.05	@	.05¼
Dary Gray	.05¾	@	.06
White	.07	@	.07¼
Truck, Heavy Gravity	.05¼	@	.05½
Truck, Light Gravity	.05¾	@	.06

Miscellaneous

Mechanical blends	.04	@	.04¼

Scrap Rubber

Collections of scrap rubber are holding up well but demand from reclaimers fell off appreciably in October as compared to previous months. Prices are slightly easier at this time but with crude rubber advancing, a rise in scrap is looked for shortly. Current New York quotations follow:

(Prices to Consumers)

Auto tire peelings	ton 18.00	@	19.00
Mixed auto	ton 10.50	@	12.00
Clean solid truck tires	ton 29.00	@	31.00
Boots and shoes	ton 25.00	@	27.00
Arctics, untrimmed	ton 18.00	@	20.00
Inner tubes, No. 1	lb. .05	@	.05¼
Inner tubes, No. 2	lb. .02½	@	.02¾
Inner tubes, Red	lb. .02⅜	@	.02½

Cotton

After a period of quiet during October, spot cotton has shown greater activity and strength within the past ten days with quotations rising steadily. Average price for October was 9.58 compared to 9.64 for September. November, so far, is considerably above this average as today's spot is 10.05c. A buying movement started on the cotton exchange immediately following yesterday's government crop estimate which raised its last report by 215,000 bales. Sharp rises in sterling have influenced the market here. American buyers with foreign connections have been putting through a large volume of buying orders abroad on account of the fact that they can buy more than one and a half pounds of cotton for the price of a pound a year ago. Prices on the New York Cotton Exchange for Middling Upland on November 9 follow:

	Oct. 9	November 9		
	Close	High	Low	Close
December	9.55	9.95	9.72	9.83
March	...	10.18	9.97	10.06
May	9.96	10.32	10.12	10.21

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/4/3	lb. .43½	@	—
Peeler, carded, 23/5/3	lb. .42½	@	—
Peeler, carded, 13/3/3	lb. .39½	@	—
Peeler, carded, 15/3/3	lb. .40½	@	—
Egyptian, carded, 23/5/3	lb. .50	@	—
Egyptian, combed, 23/5/3	lb. .54	@	—

CHAFERS

Carded, American, 1 1/8"	lb. .38	@	.39
Carded, American, 1"	lb. .32	@	—

LENO BREAKER

Carded, American, 1 1/8"	lb. .38	@	.39
Carded, American, 1"	lb. .32	@	—

Sheetings

40 inch, 2.50 yard	yd. .10¼	@	—
40 inch, 2.85 yard	yd. .08¼	@	—
40 inch, 3.15 yard	yd. .10¾	@	—
40 inch, 3.60 yard	yd. .09½	@	—
40 inch, 3.75 yard	yd. .07½	@	—
40 inch, 4.25 yard	yd. .06⅞	@	—

Ducks

Enameling	lb. .32	@	.33
Belting and Hose	lb. .30	@	—
Single filling, A grade	lb. .16	@	.16¼
Double filling	lb. .17	@	.17½

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 Tons

FROM OCTOBER 10 TO NOVEMBER 9

Date	Spot	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Sales
Oct. 10	7.88	7.85	7.94	8.04	8.18	8.32	8.46	8.57	8.70	8.82	8.94	9.06	9.18	—	150
11	7.94	7.79	7.89	7.99	8.14	8.28	8.42	8.53	8.65	8.78	8.91	9.03	9.15	—	178
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	7.63	7.60	7.70	7.80	7.95	8.08	8.21	8.31	8.41	8.51	8.61	8.71	8.80	—	393
14	7.53	7.52	7.62	7.72	7.86	8.00	8.15	8.25	8.35	8.45	8.55	8.65	8.75	—	319
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	7.00	7.90	7.00	7.11	7.21	7.33	7.47	7.57	7.68	7.77	7.86	7.97	8.07	—	626
17	7.25	7.20	7.30	7.40	7.50	7.64	7.79	7.90	8.02	8.15	8.29	8.33	8.38	—	684
18	7.06	6.94	7.04	7.14	7.28	7.40	7.53	7.63	7.74	7.83	7.93	8.01	8.10	—	511
19	6.88	6.80	6.89	6.99	7.10	7.22	7 34	7.44	7.54	7.67	7.80	7.87	7.95	—	627
20	7.06	7.02	7.12	7.22	7.31	7.45	7 60	7.68	7.77	7.93	8.10	8.16	8.22	—	579
21	7.12	7.05	7.15	7.25	7.38	7.51	7.64	7.72	7.80	7.92	8.05	8.15	8.25	—	230
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23	7.37	7.30	7.40	7.50	7.57	7.72	7.87	7.96	8.08	8.20	8.34	8.44	8.54	—	501
24	7.70	7.67	7.77	7.88	8.01	8.15	8.29	8.39	8.50	8.60	8.70	8.78	8.85	—	416
25	7.84	7.76	7.86	7.96	8.11	8.25	8.41	8.50	8.60	8.71	8.83	8.94	9.05	—	509
26	7.57	7.48	7.58	7.68	7.82	7.96	8.10	8.20	8.31	8.40	8.50	8.58	8.65	—	301
27	7.78	7.79	7.90	7.99	8.17	8.27	8.43	8.56	8.68	8.79	8.90	9.00	9.10	—	423
28	7.71	7.60	7.70	7.80	7.95	8.10	8.25	8.35	8.45	8.55	8.65	8.75	8.85	—	47
29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	7.75	—	7.75	7.83	8.00	8.14	8.28	8.40	8.53	8.63	8.73	8.83	8.93	—	354
31	7.70	—	7.75	7.81	7.96	8.10	8.24	8.34	8.45	8.57	8.70	8.80	8.90	—	379
Nov. 1	7.64	—	7.70	7.77	7.92	8.05	8.18	8.30	8.43	8.53	8.65	8.75	8.85	8.95	278
2	7.75	—	7.88	7.98	8.14	8.27	8.41	8.52	8.65	8.75	8.85	8.95	9.05	9.15	269
3	7.90	—	7.93	8.04	8.19	8.34	8.50	8.60	8.71	8.83	8.95	9.05	9.15	9.25	223
4	8.18	—	8.18	8.28	8.43	8.57	8.71	8.85	8.96	9.08	9.19	9.29	9.40	9.49	480
5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	8.12	—	8.07	8.18	8.32	8.48	8.65	8.78	8.92	8.98	9.06	9.15	9.25	9.35	421
7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8	8.50	—	8.44	8.54	8.68	8.82	8.97	9.10	9.23	9.35	9.47	9.56	9.65	9.75	579
9	8.87	—	8.80	8.90	9.07	9.23	9.39	9.53	9.68	9.77	9.88	9.98	10.08	10.18	1159

Rubber CHEMICAL Markets

NEW YORK, November 11, 1933

ACCELERATORS

Organic

A-1	lb.	.21	@	.25
A-5-10	lb.	.33	@	.36
A-7	lb.	.53	@	.65
A-11	lb.	.60	@	.75
A-16	lb.	.55	@	.65
A-19	lb.	.56	@	.75
A-32	lb.	.70	@	.80
Aldehyde ammonia, crystals	lb.	.65	@	.67
Altax	lb.			
Captax	lb			
Cryiene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.43
Diphenylguanidine	lb.	.33	@	.34
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.37½	@	.42
Guantal	lb.	.42	@	.51
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.37	@	—
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.36	@	.37
Monex	lb.	3.25	@	—
Oxynone	lb.	.48	@	.50
Phenex	lb.	.50	@	.55
Pipsol X	lb.	3.55	@	4.00
R & H 40	lb.	.40	@	.41
R & H 50	lb.	.40	@	.41
R-2	lb.	1.55	@	1.90
R-2 Base	lb.	4.55	@	5.00
Safex	lb.	1.20	@	1.25
SPDX	lb.	.75	@	—
Super-Sulphur No. 1	lb.			
No. 2	lb.			
Thiocarbanilid, drums	lb.	.25	@	.27
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.60
Tuads	lb.			
Ureka	lb.	.75	@	1.00
Ureka C	lb.	.58	@	.69
Vuicanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Z-88-P	lb.	.48	@	.60
Zimate	lb.			

Inorganic

Litharge, domestic	lb.	.05¾	@	—
Magnesia, calcined, heavy, cwt.		4.00	@	4.50

COLORS

Blacks (See Compounding Materials)

Blues

Prussian	lb.	.36	@	.37
Ultramarine	lb.	.06	@	.30

Browns

Sienna, Italian	lb.	.04	@	.08
Umber, Turkey	lb.	.04	@	.06

Greens

Chrome, light	lb.	.23	@	.26
medium	lb.	.26	@	.28
dark	lb.	.28	@	.33
Chromium Oxide, bbl.	lb.	.23	@	.27

Reds

Antimony				
crimson, 15/7	lb.	.40	@	—
sulfur, free	lb.	.52	@	.56
Indian English	lb.	.09	@	.10
Domestic (Maroon)	lb.	.11	@	—
Red oxide, pure	lb.	.10	@	.12
Rub-Er-Red, f.o.b. Easton	lb.	.03¾	@	—

Whites

Cryptone CB, No. 21	lb.	.06½	@	.06¾
Cryptone, No. 19	lb.	.06½	@	.06¾
Lithopone, Albalith	lb.	.04½	@	.04¾
Lithopone, Azolith	lb.	.04½	@	.04¾
Titanium oxide	lb.	.17	@	.19
Titanox B	lb.	.06	@	.06½
Titanox C	lb.	.06	@	.06½
XX Zinc Sulphide, bbls.	lb.	—	@	.13

Zinc Oxide—American Process

American Azo:				
ZZZ (lead free)	lb.	.05¾	@	.06
ZZ (leaded)	lb.	.05½	@	.05¾
Horsehead Lead Free Brand:				
Selected	lb.	.05¾	@	.06
Special	lb.	.05¾	@	.06
XX Red	lb.	.05¾	@	.06
XX	lb.	.05¾	@	.06
XX Green	lb.	.05¾	@	.06
Leaded Brand, Standard	lb.	.05½	@	.05¾
Sterling	lb.	.05½	@	.05¾
Superior	lb.	.05½	@	.05¾
Lehigh	lb.	.05¼	@	.05½
U. S. P., bbls.	lb.	—	@	.12¾
Kadox, black label	lb.	.09⅝	@	.09⅞
Blue label	lb.	.08⅝	@	.08⅞
Red label	lb.	.07¼	@	.07½
St. Joe, black label	lb.	.05¾	@	.06
green label	lb.	.05¾	@	.06
red label	lb.	.05¾	@	.06

Zinc Oxide—French Process

Anaconda, lead free	lb.	.05¾	@	.06
Anaconda, selected lead free	lb.	.06¼	@	.06½
Florence White seal, bbls.	lb.	—	@	.10⅞
Green seal	lb.	.09⅝	@	.09⅞
Red seal	lb.	.08⅝	@	.08⅞

Yellows

Chrome	lb.	.16	@	.16½
Ocher, dom. med.	lb.	.01½	@	.02

BLACKS

Arrow "Aerfloted"				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¼	@	—
less c.l. f.o.b. works	lb.	.05¼	@	.07
Arrow "Aerfloted" Specification, c.l. f.o.b. wks., bags	lb.	.03	@	—
Bone, powdered	lb.	.05½	@	.12½
Carbon, compressed	lb.	.02¾	@	.07
uncompressed	lb.	.02¾	@	.07
"Certified," Cabot				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¼	@	—
less c.l. f.o.b. works	lb.	.05¼	@	.07
Spherons	lb.	.02¾	@	—
"Disperso" f.o.b. La.	lb.	.028	@	.071
f.o.b. Texas	lb.	.02¾	@	.07
Drop, bbls.	lb.	.05½	@	.14
"Excello," compressed	lb.	.03	@	—
"Fumonex"	lb.	.03	@	.07
"Gastex"	lb.	.03	@	.07
Lampblack	lb.	.06	@	.08
"Micronex"				
c.l. f.o.b. works, bags	lb.	.03	@	—
c.l. f.o.b. works, cases	lb.	.04½	@	—
less c.l. f.o.b. works	lb.	.05½	@	.07
"Supreme"	lb.	.02¾	@	—
Thermatomic—"P 33"	lb.	—	@	—
"Thermax"	lb.	—	@	—
United, "Dixie" and "Kosmos"				
c.l. f.o.b. works, bags	lb.	.02¾	@	—
c.l. f.o.b. works, cases	lb.	.04¼	@	—
less c.l. f.o.b. works	lb.	.05¼	@	.07
"Velvetex"	lb.	.02½	@	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate, lump	lb.	.10½	@	.12
Asbestine	ton	15.00	@	—
Barium carbonate (98-100%)	lb.	.05	@	—
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	10.00	@	18.00
Western prime white	ton	23.00	@	—
Basofor	lb.	.04½	@	—
Bentonite	lb.	.02	@	.03
Blanc fixe dry f.o.b. works	ton	60.00	@	65.00
Carrara filler	lb.	.01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Chalk, precipitated				
Suprex white, extra lt.	ton	60.00	@	75.00
heavy	ton	45.00	@	55.00
Clay, Kaolin, domestic	ton	6.00	@	7.00
Aerfloted, Suprex	ton	6.50	@	8.00
Congaree	ton	9.00	@	—
Dark Blue Ridge	ton			
Dixie	ton			
Langford	ton			
Lexington	ton	10.00	@	22.00
Par	ton			
Tensulite		15.00	@	—
Cotton Flock	lb.	.08	@	.16
Glues, extra white	lb.	.15	@	.22
medium white	lb.	.12	@	.14
Kalite No. 1	ton	30.00	@	55.00
Kalite No. 3	ton	40.00	@	65.00
Magnesia, carbonate	lb.	.06	@	.06¾
Mica	lb.	.04	@	—
Rottonstone (powdered)	ton	23.50	@	28.00
Soapstone, powdered	ton	16.00	@	18.00
Starch, powdered	cwt.	2.50	@	2.60
Talc, domestic	ton	12.00	@	16.00
Pyrax A	ton			
Whiting, commercial	cwt.	.85	@	1.10
English cliffstone	cwt.	1.50	@	1.70
Sussex	ton			
Witco	ton	20.00	@	—
Zinc Carbonate	lb.	.10¼	@	—
Zinc Stearate	lb	.20½	@	.21

MINERAL RUBBER

Genasco (factory)	ton	30.00	@	43.00
Granulated M. R.	ton			
Hard Hydrocarbon	ton			
Parmr, solid	ton	28.00	@	28.00
Pioneer, MR, solid	ton	40.00	@	42.00
Pioneer-granulated	ton	50.00	@	52.00

SOFTENERS

Acids

Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 66 degrees	cwt.	1.55	@	1.80
Tartaric, crystals	lb.	.23½	@	—

Acids, Fatty

Laurex	lb.	.15	@	.16
Stearex	lb.	.08	@	.12
Stearic, double pressed	lb.	.08	@	.12

Alkalies

Caustic Soda, 76%	cwt.	2.55	@	—
Soda Ash, 58% C.L.	cwt.	1.20	@	1.35

Oils

Corn, refined, bbls.	lb.	—	@	.05¾
Cottonseed, crude	gal.	—	@	.04
Cycline Oil	gal.	.15	@	.28
Degras (c.l. 100 bbls.)	lb.	.02¾	@	—
Less c.l. (10-25 bbls.)	lb.	.03	@	—
Lots less than 10 bbls.	lb.	.03¼	@	—
Fluxrite	lb.	.05½	@	.06½
Palm Lagos	lb.	.04¾	@	—
Niger	lb.	.02¾	@	.03
Para-Flux	gal.	.17	@	—
Petrolatum, light	lb.	.02½	@	—
Pigmentaroil	gal.	.13	@	.18
Pine, steam distilled	gal.	.59	@	.61
destructively distilled	gal.	.56	@	.58
Tackol	lb.	.08½	@	.18
Witco Palm Oil	lb.	.07½	@	—
Witco Softener (f.o.b. wks.)	lb.	.02	@	—

Resins and Pitches

Pitch, Burgundy	lb.	.05	@	.06
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	6.00	@	—
Rosin, grade K, 290 lb.	bbl.	5.50	@	—
Pigmentar	gal.	.13	@	.18
Tar Retort, 50 gal.	bbl.	9.50	@	10.00

Solvents

Acetone, pure	lb.	.10	@	—
Alcohol, denatured, No. 1 bbls.	gal.	.30½	@	.41½
Benzol, 90%	gal.	.20	@	.22
Carbon, bisulfide	lb.	.05	@	.06
Carbon, tetrachloride	lb.	.05½	@	.06
Dipentene	gal.	.31	@	.41
Dryolene (f.o.b. Okla.)	gal.	.10	@	.10½
Ethylene dichloride	lb.	.05	@	.06
Gasoline, steel bbls.	gal.	.16	@	—
Naphtha, solvent	gal.	.26	@	.31
Rub-Sol (f.o.b. Okla.)	gal.	.09	@	—
Turpentine, spirits	gal.	.55	@	—
wood	gal.	.50	@	—
destructively distilled	gal.	.45	@	—

Waxes

Beeswax, white	lb.	.30	@	.32
Carnauba	lb.	.25	@	.26
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.05	@	.06
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30

Paraffin (c.l.—f.o.b. N. Y.)

Yellow crude scale	lb.	.02¾	@	.03½
White crude scale 124/126	lb.	.02	@	.02½
Refined, 125/127, 138/140	lb.	.03	@	.07

ANTI-OXIDANTS

AgeRite, Gel	lb.			
Powder	lb.			
Resin	lb.			
White	lb.			
Albasan	lb.	.70	@	.75
Antox	lb.			
B-L-E	lb.	.57	@	.60
Flectol A and Flectol-B	lb.	.54	@	.62
Neozone	lb.			
Oxynone	lb.	.48	@	.50
Resistox	lb.	.52	@	.65
Retardex	lb.	.35	@	.40
Stabilite	lb.	.57	@	.62
Stabilite Alba	lb.	.70	@	.75
VGB	lb.	.55	@	.60

SPECIALTIES

Aromatics- Rodo	lb.			
Para-Dors No. 5145	lb.	2.00	@	—
Sunproof	lb.	.35	@	.37½
Sponge Paste	lb.	—	@	.30
Tonox	lb	.58	@	.60

MOLD LUBRICANTS

Dipex	lb.	.06	@	.08
Sericite, f.o.b. N. Y.	ton	$65.00	@	—
Zip	lb.	—	@	—

SUBSTITUTES

Black	lb.	.06	@	.08
White	lb.	.07½	@	.12
Brown	lb.	.06½	@	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.04	@	—
Sulfur flour.				
Ref'n'd. 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags	cwt.	1.75	@	2.10
Telloy	lb			
Vandex	lb			

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1931:							
Aug.	38,669	5,138,404	5.93	2,324	345,953	6.65	36,345
Sept.	38,494	4,970,324	5.76	1,362	187,431	6.14	37,132
Oct.	41,131	4,803,582	5.21	1,527	203,574	5.95	39,604
Nov.	43,345	4,742,218	4.72	1,403	198,284	6.31	43,345
Dec.	53,536	5,610,120	4.68	2,462	326,382	5.91	51,070
1932:							
Jan.	33,221	3,387,505	4.55	1,524	185,466	5.43	31,697
Feb.	27,959	2,690,250	4.29	1,915	222,584	5.19	26,044
Mar.	45,197	4,251,801	4.19	2,227	240,128	4.84	42,970
April	37,903	3,181,343	3.74	2,128	196,934	4.53	35,775
May	34,182	2,798,914	3.71	1,505	144,561	4.30	32,677
June	40,808	2,647,085	2.89	1,981	134,336	3.02	39,136
July	32,306	2,102,915	2.91	2,030	179,699	3.95	30,276
August	33,449	2,027,045	2.71	1,339	128,952	4.29	32,110
Oct.	35,096	2,436,522	3.10	1,059	98,022	4.13	34,037
Nov.	28,908	2,263,469	3.48	1,745	158,618	4.06	27,163
Dec.	31,384	2,360,061	3.34	770	66,165	3.98	30,614
1933:							
Jan.	29,822	2,213,828	3.03	1,403	109,916	3.49	28,419
Feb.	22,603	1,554,086	3.12	1,244	102,129	3.73	21,359
Mar.	27,936	1,867,657	2.98	1,127	86,216	3.42	26,809
April	20,240	1,291,136	2.85	798	70,111	3.92	19,442
May	26,002	1,694,963	2.93	1,842	189,451	4.59	24,894
June	22,900	1,780,495	3.47	1,276	156,168	5.46	21,624
July	44,625	4,293,111	4.29	1,419	219,945	6.92	43,206
August	44,257	5,391,709	5.44	2,205	302,132	6.12	42,052
Sept.	44,912	6,110,956	6.07	2,369	335,798	8.89	42,543

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule: Tons	Guayule: Dollars	Balata: Tons	Balata: Dollars	Jelutong: Tons	Jelutong: Dollars	Liquid Latex (1): Tons	Liquid Latex (1): Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,677
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1932:								
Nov.	—	—	134	15,983	163	20,296	526	70,785
Dec.	—	—	22	5,209	276	36,298	632	79,250
1933:								
Jan.	—	—	33	7,815	357	40,586	841	100,900
Feb.	—	—	12	2,923	391	52,171	367	46,037
Mar.	—	—	45	11,963	437	56,262	539	55,731
April	—	—	7	2,054	210	26,856	794	80,794
May	—	—	35	9,869	463	55,560	734	71,008
June	—	—	759	1,514,296	466	61,229	604	66,827
July	—	—	238	76,141	638	79,049	618	85,636
Aug.	—	—	272	527,147	390	55,509	1,156	196,138
Sept.	—	—	65	30,738	761	149,296	1,343	267,516

(1) Latex import figures not available before 1924. Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1926	1927	1928	1929	1930	1931	1932	1933
Jan.	32,196	31,518	34,403	43,002	36,194	28,557	27,962	21,661
Feb.	31,136	30,137	33,702	41,594	33,302	28,797	30,011	21,638
Mar.	32,936	36,141	35,688	44,730	35,540	32,788	27,828	18,047
Apr.	32,696	35,871	32,772	47,521	39,686	33,321	25,953	26,226
May	29,364	34,592	37,333	49,233	39,386	37,817	30,597	44,580
June	28,598	33,801	37,676	43,227	34,195	37,916	41,475	51,326
July	27,577	29,219	37,407	41,526	29,508	31,397	29,976	50,184
Aug.	34,533	33,460	42,927	38,274	30,850	27,586	22,372	44,939
Sept.	32,904	27,214	39,882	34,707	25,515	23,638	22,491	35,686
Oct.	29,936	26,790	40,857	34,800	27,516	22,277	21,018	—
Nov.	28,080	26,792	37,461	27,659	23,691	22,943	21,910	—
Dec.	26,293	25,492	31,232	25,531	21,687	21,409	16,990	—
Tot.	366,149	371,027	441,340	469,804	375,980	348,986	313,122	—

Figures on Quarterly Basis

Quarter	1926	1927	1928	1929	1930	1931	1932	1933
Jan./Mar.	94,301	99,216	103,558	128,565	101,610	89,652	85,309	64,211
Apr./June	87,109	103,242	103,500	139,292	112,229	107,755	92,643	121,445
July/Sept.	93,793	89,210	117,573	113,746	85,261	83,632	72,523	—
Oct./Dec.	83,212	80,860	117,597	84,872	72,020	65,645	64,145	—
Totals	358,415	372,528	442,227	466,475	371,120	346,684	314,620	—

Note—The quartlerly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*	Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,000
1926	180,582	164,500	45.9	23,213	1931	133,351	124,126	33.9	19,257
1932:									
Jan.	8,753	8,440	30.2	18,712	July	5,417	5,131	18.1	16,333
Feb.	8,731	8,332	27.7	18,659	Aug.	3,264	4,382	18.6	14,629
Mar.	8,613	7,420	26.7	19,721	Sept.	5,308	5,235	23.2	14,059
Apr.	5,561	5,555	21.6	21,525	Oct.	6,605	5,494	26.1	13,911
May	5,024	6,070	20.8	18,889	Nov.	6,542	5,234	23.9	14,047
June	5,923	7,031	18.0	16,870	Dec.	5,626	3,968	23.4	15,202
1933:									
Jan.	5,245	4,506	20.8	15,117	July	12,049	10,317	20.6	14,108
Feb.	4,530	4,087	18.9	15,403	Aug.	11,708	9,446	21.0	15,037
Mar.	3,847	3,454	19.1	15,496	Sept.	10,435	7,727	21.7	15,869
Apr.	4,617	4,407	16.8	14,370	Oct.	.....	.....	...	.....
May	8,366	7,770	17.4	13,734	Nov.	.....	.....	...	.....
June	10,591	9,674	18.8	13,231	Dec.	.....	.....	...	.....

* Stocks on hand at the end of month or year.
(Rubber Manufacturers' Association figures raised to 100%)

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1931	1932	1933		1931	1932	1933
January	26,844	26,038	26,510	August	39,459	35,706	37,426
February ..	26,133	25,378	23,312	September .	36,670	33,828	34,303
March	31,037	29,597	28,227	October ...	35,051	32,680	.....
April	33,400	31,234	30,176	November .	30,640	29,895	.....
May	35,716	32,016	33,999	December ..	30,529	27,110	.....
June	38,375	39,489	37,710				
July	39,459	30,929	34,458	Total	403,418	373,900	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1931																																
July	6⅝	6⅝	6⅝	—	—	6⅝	6⅝	6⅝	6⅝	6⅝	6⅝	—	6⅝	6⅝	6⅝	—	6⅝	6⅝	—	6⅝	6⅝	6⅝	6¼	6¼	6½	—	6¼	6	6	6⅜	6⅝	6⅝
August	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	6½	5½	5⅝	5⅝	5⅝	5½	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5⅝	5¼	5¼	5¼	5⅛	5⅛	5⅛	5⅛	5⅛
September	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛	5⅛
October	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	—	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	—	4⅝
November	—	4½	4½	4½	4½	4½	4½	4½	4½	4½	—	4½	4½	4½	4½	—	4½	4½	4½	4½	4½	4½	4½	4½	4½	—	4½	4½	4½	4½	—	4½
December	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
1932																																
January	—	—	—	4½	4½	4½	4½	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	—	4¼
February	—	4⅜	4⅜	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	4½	—	4½
March	—	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
April	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
May	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
June	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
July	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
August	—	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛	3⅛
September	—	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛	4⅛
October	—	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
November	—	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
December	—	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝	3⅝
1933																																
January	—	3¼	3¼	3¼	3¼	3¼	3¼	—	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼	3¼
February	—	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾	2¾
March	—	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
April	—	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞	2⅞
May	—	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜	4⅜
June	—	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛	6⅛
July	—	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛	7⅛
August	—	7⅜	7⅜	8	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜	7⅜
September	7⅛	—	7⅛	8	8	8¼	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛
October	7⅛	—	7⅛	8	8	8¼	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛
November	7⅛	—	7⅛	8	8	8¼	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛	—	8⅛

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1927

Month	1927 Cents	1928 Cents	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	38.75	40.25	20.14	15.24	8.34	4.38	3.08
Feb.	38.25	32.75	23.97	15.85	7.70	4.03	2.95
Mar.	41.04	26.82	24.55	15.34	7.71	3.35	3.01
Apr.	40.86	18.97	21.18	14.93	6.43	3.02	3.56
May	40.76	18.99	21.46	14.24	6.49	3.09	4.95
June	37.25	19.59	20.64	12.45	6.35	2.66	6.15
July	34.87	19.40	21.30	11.24	6.37	2.89	8.01
Aug.	35.12	19.46	20.59	9.96	5.38	3.63	7.31
Sept.	33.67	18.47	20.37	8.28	5.08	3.84	7.30
Oct.	34.32	18.83	19.67	8.20	4.87	3.65	7.64
Nov.	37.58	18.26	16.62	9.01	4.65	3.44	—
Dec.	40.63	17.97	16.12	9.05	4.64	3.24	—
Average for Year	37.72	22.48	20.55	11.98	6.17	3.49	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Aug.	Sept.	Oct.	Nov.	Day	Aug.	Sept.	Oct.	Nov.
1	3⅜	3¾	—	3⅞	17	3¾	—	3⅛	—
2	3⅜	—	4⅛	3⅛	18	3¾	3⅛	3⅛	—
3	4⅛	—	3⅛	3⅛	19	—	3⅛	3⅛	—
4	3⅜	3⅛	4	4	20	—	3⅛	3⅛	—
5	—	3⅛	3⅞	—	21	3⅛	3⅛	3⅛	—
6	—	3⅛	4	3⅛	22	—	3⅛	3⅛	—
7	—	3⅛	4	3⅛	23	3¾	3⅛	3⅛	—
8	4	3⅛	—	3⅛	24	—	—	3⅛	—
9	3⅜	3⅛	3⅜	4⅜	25	3⅛	3⅛	3⅛	—
10	4	—	4⅜	—	26	—	3⅞	3⅛	—
11	3⅜	3⅛	4	—	27	—	3⅛	3⅛	—
12	—	3⅛	—	—	28	3⅛	3⅞	3⅛	—
13	—	3⅛	3⅜	—	29	3¾	4⅜	—	—
14	3⅜	3⅝	3⅛	—	30	3¾	4⅜	3⅛	—
15	3⅜	3⅛	—	—	31	3¾	—	3⅛	—
16	3⅛	3⅝	3⅜	—					

Average Monthly Price Per Pound

Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence	Month	1930 Pence	1931 Pence	1932 Pence	1933 Pence
Jan.	7.471	4.160	3.052	2.264	Aug.	4.880	2.385	2.654	3.811
Feb.	7.948	3.823	2.760	2.093	Sept.	4.075	2.524	2.485	3.728
Mar.	7.595	3.822	2.047	2.099	Oct.	4.023	2.898	2.425	3.957
Apr.	7.391	3.082	1.876	2.323	Nov.	4.440	2.890	2.518	—
May	6.926	3.035	1.825	2.966	Dec.	4.516	3.115	2.444	—
June	6.195	3.082	1.750	3.392	Average for Year	5.926	3.155	2.434	—
July	5.648	3.048	1.875	3.860					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Sept.	Oct.	Nov.	Day of Month	Sept.	Oct.	Nov.	Day of Month	Sept.	Oct.	Nov.
1	9.45	—	9.75	11	9.05	9.55	—	21	9.65	9.40	—
2	—	9.90	9.75	12	9.05	—	—	22	9.80	—	—
3	—	9.80	9.80	13	9.35	9.35	—	23	10.15	9.50	—
4	—	9.90	9.75	14	9.55	9.40	—	24	—	9.70	—
5	9.10	9.70	—	15	9.60	—	—	25	10.05	9.90	—
6	9.30	9.50	9.55	16	9.70	8.95	—	26	10.05	9.80	—
7	9.20	9.50	—	17	—	9.45	—	27	10.00	9.85	—
8	9.00	—	9.90	18	10.15	9.35	—	28	9.90	9.75	—
9	8.85	9.65	10.05	19	10.45	9.35	—	29	9.90	—	—
10	—	9.55	—	20	10.05	9.40	—	30	9.95	9.70	—
								31	—	9.75	—

Average Monthly Price Per Pound

Month	1930 Cents	1931 Cents	1932 Cents	1933 Cents	Month	1930 Cents	1931 Cents	1932 Cents	1933 Cents
Jan.	17.21	10.27	6.65	6.28	Aug.	12.03	7.21	7.43	9.55
Feb.	15.62	10.96	6.85	6.05	Sept.	10.85	6.52	6.30	9.64
Mar.	15.13	10.90	6.86	6.39	Oct.	10.63	6.32	6.30	9.58
Apr.	16.39	10.19	6.16	7.02	Nov.	10.96	6.44	6.22	—
May	16.43	9.38	5.72	8.64	Dec.	10.02	6.24	6.00	—
June	14.48	9.05	5.22	9.47	Average for Year	13.57	8.56	6.41	—
July	13.10	9.28	5.87	10.76					

*Exchanges closed due to Bank Moratorium.

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1931	ON HAND 1932	ON HAND 1933	AFLOAT 1931	AFLOAT 1932	AFLOAT 1933	ON HAND AND AFLOAT 1931	ON HAND AND AFLOAT 1932	ON HAND AND AFLOAT 1933
Jan.	209,487	322,860	396,376	56,187	42,234	32,539	265,674	365,094	428,915
Feb.	212,833	322,711	381,794	63,680	51,728	32,898	276,513	373,845	414,692
Mar.	217,804	334,566	390,135	63,133	44,190	29,531	280,937	378,756	419,666
Apr.	228,382	343,099	382,167	56,700	40,387	30,745	285,082	383,486	412,912
May	220,799	346,231	364,623	73,564	50,453	43,342	294,363	396,684	407,965
June	225,536	345,702	333,954	69,421	43,079	63,608	294,957	388,781	397,562
July	234,822	345,927	326,609	66,873	37,894	57,435	301,695	383,821	384,044
Aug.	240,816	357,342	325,148	61,469	41,282	53,084	302,285	398,624	378,232
Sept.	254,324	365,789	334,637	62,420	46,188	54,525	316,744	411,977	389,162
Oct.	273,456	373,823	.....	68,427	40,176	.....	341,883	413,999	.....
Nov.	292,493	377,996	.....	77,443	40,876	.....	369,936	418,875	.....
Dec.	322,826	388,229	.....	53,940	38,360	.....	376,766	426,589	.....

(Rubber Manufacturers' Association figures raised to 100%)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1931	1932	1933	At end of	1931	1932	1933
Jan.	81,093	67,166	36,481	July	81,317	48,842	41,178
Feb.	82,265	65,942	37,182	Aug.	81,560	47,079	39,480
Mar.	84,736	64,280	40,845	Sept.	79,692	44,942	39,237
Apr.	86,831	61,848	40,911	Oct.	76,778	42,327	.....
May	86,683	56,089	41,998	Nov.	73,911	40,606	.....
June	83,071	51,009	43,032	Dec.	69,470	37,407	.....

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1933					
April	40,845	40,498	40,019	40,547	41,234
May	41,478	41,695	41,843	41,969	
June	42,457	42,723	43,361	44,043	
July	43,748	43,319	42,745	42,046	41,161
August	41,211	40,544	40,166	39,237	
September	39,472	39,257	39,191	39,292	39,221
October	38,935	38,565	38,457	37,898	
November	37,170				

Stocks in Liverpool

1933				
April	53,989	54,305	54,762	54,521	54,336
May	55,148	56,139	57,117	56,795	
June	57,560	58,560	59,326	59,272	
July	59,560	59,372	59,135	59,901	58,864
August	58,540	58,391	58,050	57,508	
September	57,266	57,213	56,826	56,625	56,164
October	54,899	54,134	53,500	52,969	
November	52,818				

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1930	1931	1932	1933	End of	1930	1931	1932	1933
Jan.	39,727	48,802	48,850	22,525	July	45,459	51,203	17,017	36,972
Feb.	44,371	49,283	46,954	21,530	Aug.	48,132	48,971	20,649	38,601
Mar.	45,657	49,590	46,591	24,594	Sept.	44,015	47,025	20,415	36,948
Apr.	48,473	45,868	39,663	25,460	Oct.	39,930	52,132	23,158	.....
May	44,715	44,278	38,690	29,822	Nov.	41,674	46,497	25,419	.....
June	42,451	47,517	19,770	34,676	Dec.	45,963	45,795	25,341	.....

STOCKS IN OTHER CENTRES

End of 1932:	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Nov.	36,363	21,860	2,229	3,565	5,530
Dec.	40,222	24,430	2,170	3,844	5,552
1933:					
Jan.	38,844	25,080	2,143	4,662	5,676
Feb.	37,323	28,540	2,033	4,210	6,006
Mar.	33,494	26,180	2,183	3,779	5,780
Apr.	33,391	27,710	2,214	3,428	5,204
May	32,613	24,090	1,534	3,177	4,790
June	35,919	22,930	1,147	2,913	4,321
July	35,020	22,900	1,007	3,208	3,830
Aug.	34,463	22,900	1,003	3,411	....
Sept.	33,751	.....	.....	.....	....

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1923	23,140,620	0.6	1928	24,247,282	81.6
1924	21,863,311	19.7	1929	24,141,502	80.3
1925	26,001,664	66.8	1930	17,364,096	80.1
1926	24,199,524	78.8	1931	11,253,800	76.7
1927	19,700,003	79.1	1932	6,004,252	78.7
1933:			1933:		
January	727,308	79.1	July	900,227	—
February	579,789	—	August	960,795	—
March	346,755	—	September	701,302	—
April	898,318	—	October	522,829	—
May	938,083	—	November	———	—
June	1,015,181	—	December	———	—

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	60,845	61,237	64,439	77,944	68,726	50,965	48,739	40,085
Shipments	59,262	59,002	64,059	74,296	69,395	53,638	48,151	40,260
Inventory[2]	8,142	10,456	10,264	13,624	11,838	9,003	7,775	7,644

Figures for Recent Months

	PRODUCTION 1931	PRODUCTION 1932	PRODUCTION 1933	SHIPMENTS 1931	SHIPMENTS 1932	SHIPMENTS 1933	INVENTORY 1931	INVENTORY 1932	INVENTORY 1933
Jan.	3,675	3,462	2,258	3,744	3,253	2,597	8,957	7,912	7,237
Feb.	3,985	3,871	2,339	3,402	2,553	2,292	9,536	9,172	7,377
Mar.	4,663	3,671	2,038	4,122	2,954	2,092	10,014	9,878	7,290
Apr.	4,944	3,517	3,123	4,932	3,698	3,654	10,031	9,846	6,778
May	5,679	3,820	5,189	5,415	4,258	5,180	10,312	9,379	6,760
June	5,672	5,643	6,100	5,572	10,065	6,305	10,447	4,999	6,615
July	4,926	3,617	5,714	5,462	2,404	5,497	9,919	6,203	6,844
Aug.	3,906	3,089	4,994	4,960	2,655	4,707	8,896	6,659	7,070
Sept.	3,172	2,539	.....	3,932	3,082	.....	8,158	6,096	.....
Oct.	2,974	2,569	.....	2,852	1,799	.....	8,300	6,876	.....
Nov.	2,500	2,304	.....	2,887	1,711	.....	7,919	7,454	.....
Dec.	2,643	1,983	.....	2,781	1,819	.....	7,775	7,644	.....

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1925	1926	1927	1928	1929	1930	1931	1932
Production	82,614	76,618	70,823	80,180	68,829	52,420	48,333	36,801
Shipments	81,004	71,591	72,896	77,127	70,592	54,938	50,021	37,935
Inventory[2]	11,313	16,200	13,692	16,117	12,807	9,999	7,922	6,749

Figures for Recent Months

	PRODUCTION 1931	PRODUCTION 1932	PRODUCTION 1933	SHIPMENTS 1931	SHIPMENTS 1932	SHIPMENTS 1933	INVENTORY 1931	INVENTORY 1932	INVENTORY 1933
Jan.	3,623	3,308	2,093	4,062	3,529	2,535	9,439	7,719	6,197
Feb.	3,916	3,281	2,224	3,400	2,728	2,102	9,921	8,760	6,357
Mar.	4,450	3,502	1,883	3,789	2,686	1,902	10,475	9,448	6,369
Apr.	4,617	3,225	2,853	4,636	3,385	3,051	10,413	9,441	6,189
May	5,413	3,409	4,700	5,281	3,867	4,463	10,459	8,913	6,382
June	5,358	5,279	5,448	5,397	9,019	5,778	10,504	5,174	6,097
July	4,955	2,937	5,603	5,831	2,160	5,211	9,589	5,975	6,440
Aug.	4,435	2,748	4,916	5,301	2,503	4,687	8,774	6,127	6,628
Sept.	3,449	2,601	.....	4,150	3,098	.....	8,095	5,753	.....
Oct.	3,077	2,187	.....	2,813	1,658	.....	8,321	6,214	.....
Nov.	2,443	2,005	.....	2,594	1,578	.....	8,119	6,662	.....
Dec.	2,597	1,779	.....	2,767	1,724	.....	7,922	6,749	.....

(1) **Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.**

(2) **Held by manufacturers at end of period indicated.**

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,850	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932							
June	183,106	160,338	22,768	7,112	6,308	804	190,204
July	109,143	94,705	14,438	7,472	6,773	699	118,611
Aug.	90,325	75,907	14,418	4,067	3,166	901	94,391
Sept.	84,150	64,748	19,402	2,342	1,741	601	86,483
Oct.	48,702	35,107	13,595	2,923	2,361	562	51,857
Nov.	59,557	47,532	12,025	2,204	1,669	535	61,760
Dec.	107,353	86,149	21,204	2,139	1,561	578	109,542
Total	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933							
Jan.	130,044	108,326	21,718	3,358	2,921	437	133,402
Feb.	106,825	91,492	15,333	3,298	3,025	273	110,123
Mar.	117,949	99,885	18,064	6,632	5,927	705	124,581
Apr.	180,667	153,350	27,317	8,255	6,957	1,298	189,922
May	218,303	184,698	33,605	9,396	8,024	1,372	227,669
June	253,322	211,483	41,839	7,323	6,005	1,318	260,645
July	233,088	195,023	38,065	6,540	5,322	1,218	239,628
Aug.	236,487	195,144	41,343	6,079	4,919	1,160	242,566
Sept.	196,082	160,900	35,182	5,808	4,358	1,450	201,990

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[4]							
	Gross Exports	Gross Exports Minus Imports		India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[4]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,580
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,976	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1932:															
Mar.	39,903	6,658	33,245	3,462	284	501	460	217	4,946	6,863	6,299	774	715	77	57,843
Apr.	36,670	4,682	31,988	3,210	365	459	345	130	6,722	6,090	4,935	962	487	99	55,792
May	40,297	5,677	34,620	3,824	304	595	344	118	6,552	6,551	6,012	964	416	278	60,578
June	36,566	5,665	30,901	3,444	359	481	345	166	5,610	7,516	5,507	1,218	394	139	56,080
July	40,723	5,346	35,377	3,501	99	442	400	184	5,779	6,257	6,145	1,233	232	141	59,790
Aug.	39,327	7,371	31,956	4,717	129	506	400	300	4,803	4,882	7,244	1,088	303	49	56,877
Sept.	41,973	8,869	33,104	5,238	122	614	400	340	3,858	6,485	7,664	1,621	318	78	59,733
Oct.	37,931	9,798	28,133	2,945	139	583	350	428	4,022	7,051	8,944	1,147	414	247	54,403
Nov.	40,098	10,072	30,026	4,146	185	683	350	371	4,368	6,250	9,080	809	1,164	156	57,588
Dec.	40,118	10,089	30,029	5,801	367	644	350	406	4,683	7,066	8,594	1,211	824	150*	59,493
1933:															
Jan.	46,599	7,857	38,742	4,602	318	590	458	305	4,766	5,630	6,849	1,957	554	125*	58,887
Feb.	37,564	6,167	31,397	5,064	304	541	458	368	4,895	5,119	6,081	895	620	125*	55,867
Mar.	42,059	7,964	34,095	4,905	389	571	458	304	5,092	6,466	6,999	1,102	995	125*	61,501
Apr.	36,752	7,758	28,994	4,582	272	624	583	235	5,226	5,969	8,147	1,122	556	125*	56,435
May	42,902	13,664	29,238	4,643	475	1,091	583	359	6,782	7,298	13,195	1,371	918	125	66,078
June	41,411	16,538	24,873	5,198	377	1,149	582	632	7,352	6,654	14,779	1,369	704	125*	63,794
July	50,531	18,772	31,759	4,551	270	1,358	600*	797	7,367	8,580	16,534	1,310	913	125*	74,164
Aug.	52,266	17,869	34,397	5,692	246	955	600*	926	6,960	7,985	15,161	1,327	800*	125*	74,674
Sept.	49,607	15,146	34,461	5,731		1,027	600*	611	5,868	9,164	15,005	1,159	800*		
Oct.	61,002														

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown when available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,809
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	587	371,409
1921	179,786	42,087	15,135	21,920	8,124	11,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,629
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,987	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,493	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,351	12,018	9,490	6,482	686	4,224	2,055	2,672	632,768
1928	467,572	4,846	36,498	37,855	30,447	25,621	12,433	15,184	8,430	7,958	2,245	4,418	3,178	3,188	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,633
1930	458,086	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,281	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1932:															
Feb.	26,483	5,930	2,898	4,356	1,723	6,781	1,189	2,931	758	506	500	708	313	306	55,382
Mar.	43,361	3,585	2,482	3,436	2,588	5,398	1,423	2,745	1,211	721	112	456	359	644	68,521
Apr.	36,326	6,826	2,956	3,737	1,600	3,684	1,083	764	1,549	847	348	474	417	1,259	61,870
May	32,818	1,110	2,277	3,447	1,416	3,917	1,033	3,743	2,048	617	286	707	272	350	51,821
June	39,136	1,853	3,666	3,405	2,834	2,834	1,534	5,291	1,421	449	127	578	196	280	63,604
July	30,494	4,082	3,125	3,380	1,529	2,544	1,116	1,735	624	723	—214	784	258	1,207	51,387
Aug.	32,650	6,671	4,919	4,006	970	3,390	1,615	1,740	751	1,211	—66	611	210	557	59,235
Sept.	26,865	3,942	5,845	3,674	2,770	5,878	971	1,376	625	694	103	534	267	406	54,220
Oct.	34,748	2,927	4,715	4,177	1,207	5,653	510	1,858	569	627	553	537	489	986	59,551
Nov.	27,689	4,950	3,830	3,577	1,593	4,563	1,265	1,481	1,653	1,035	275	489	631	650	53,681
Dec.	31,246	1,182	3,205	4,623	941	5,603	2,103	3,720	745	1,298	348	544	485	2,602	57,645
1933:															
Jan.	29,260	3,277	5,858	4,241	1,189	7,611	3,005	1,558	1,275	1,388	308	640	252	838	60,700
Feb	22,970	7,102	6,603	4,460	1,175	8,508	994	2,820	2,001	1,670	375	564	132	681	60,055
Mar.	27,348	8,883	6,093	4,425	1,114	6,035	1,604	2,088	1,904	952	282	649	340	688	62,405
Apr.	20,236	7,765	6,808	4,805	555	5,495	2,215	2,274	1,580	882	163	606	281	400	53,565
May	24,894	11,085	4,144	4,622	1,704	5,289	1,278	1,691	425	710	—525	536	433	432	56,718
June	22,228	8,739	4,056	3,639	1,441	3,330	1,997	2,000	613	469	—519	772	541	400	49,706
July	43,824	3,961	3,774	4,103	1,192	1,460	1,146	2,952	2,347	299	16	486	435	287	66,282
Aug.	43,208	4,330	5,489	4,193	1,795	4,426	1,249	3,312	1,500	325	209	616	606	2,759	74,017
Sept.	43,886	4,341	4,111		2,620						189				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.